

Facility: <b>River Bend Station</b>		Date of Exam: <b>September 2004</b>																
Tier	Group	RO K/A Category Points											SRO-Only Points					
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	K	A	A 2	G *	Total
1. Emergency & Abnormal Plant Evolutions	1	1	6	3	0	0	0	4	3	0	0	3	20	1	1	2	4	8
	2	2	0	2	0	0	0	1	1	0	0	1	7	1	1	2	0	4
	Tier Totals	3	6	5	0	0	0	5	4	0	0	4	27	2	2	4	4	12
2. Plant Systems	1	3	2	4	1	2	4	4	2	0	2	2	26	0	0	2	2	4
	2	1	0	1	1	0	2	1	2	2	2	0	12	1	1	0	0	2
	Tier Totals	4	2	5	2	2	6	5	4	2	4	2	38	1	1	2	2	6
3. Generic Knowledge and Abilities Categories				1	2	3	4	10	1	2	3	4	7					
				3	2	2	3		2	2	1	2						

**Notes:**

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.
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. 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.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
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.
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.
8. For Tier 3, enter the K/A numbers, descriptions, importance ratings, and point totals on Form ES-401-3.
9. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

## RIVER BEND STATION

## BWR EXAMINATION OUTLINE

ES-401-1

September 2004

## EMERGENCY &amp; ABNORMAL PLANT EVOLUTIONS - TIER 1 GROUP 1 (RO)

E/APE#/NAME/SAFETY FUNCTION <i>CFR REFERENCES</i>	K 1	K 2	K 3	A 1	A 2	G	K/A TOPIC(S)	IR	TYPE	QNO	QID
295001 Loss of Forced Core Circulation / 1 & 4 <i>CFR 41.3/41.5/41.6/41.14</i>		1					The <b>interrelations between</b> Partial or Complete Loss of Forced Core Flow Circulation and the <b>Recirculation System</b> .	3.6	<b>BANK 2000</b>	<b>1</b>	<b>419</b>
295003 Partial or Total Loss of AC Power / 6 <i>CFR 41.8-41.10</i>					1		<b>Determine/interpret the cause of partial or complete loss of A.C. power</b> as it applies to partial or complete loss of A.C. power.	3.4	<b>NEW</b>	<b>2</b>	<b>888</b>
295004 Partial or Total Loss of DC Power / 6 <i>CFR 41.7/41.8</i>			3				The <b>reasons for reactor SCRAM</b> as it applies to partial or complete loss of D.C. Power.	3.1	<b>NEW</b>	<b>3</b>	<b>889</b>
295005 Main Turbine Generator Trip / 3 <i>CFR 41.4</i>		2					The <b>interrelations between</b> Main Turbine Generator Trip and <b>feedwater temperature</b> .	2.9	<b>NEW</b>	<b>4</b>	<b>890</b>
295006 SCRAM / 1 <i>CFR 41.10/43.5</i>			1				The <b>reasons for reactor water level response</b> as they apply to SCRAM.	3.8	<b>NEW</b>	<b>5</b>	<b>887</b>
295016 Control Room Abandonment / 7 <i>CFR 41.7</i>					6		<b>Determine/interpret cooldown rate</b> as it applies to Control Room Abandonment.	3.3	<b>NEW</b>	<b>6</b>	<b>942</b>
295018 Partial or Total Loss of CCW / 8 <i>CFR 41.4/43.5</i>						1.28	Knowledge of the <b>purpose and function</b> of major system <b>components and controls</b> .	3.2	<b>NEW</b>	<b>7</b>	<b>891</b>
295019 Partial or Total Loss of Inst. Air / 8 <i>CFR 41.74/41.10/43.5</i>				4			<b>Operate/monitor service air isolation valves</b> as they apply to Partial or Complete Loss of Instrument Air.	3.3	<b>NEW</b>	<b>8</b>	<b>54</b>
295021 Loss of Shutdown Cooling / 4 <i>CFR 41.2/41.3/41.8/41.14</i>				2			<b>Operate/monitor RHR/Shutdown Cooling</b> as it applies to Loss of Shutdown Cooling.	3.5	<b>NEW</b>	<b>9</b>	<b>892</b>
295023 Refueling Accidents / 8 <i>CFR 41.11/41.12/43.5/43.7</i>				8			<b>Operate/monitor Containment Building Ventilation</b> as it applies to Refueling Accidents.	3.3	<b>NEW</b>	<b>10</b>	<b>893</b>
295024 High Drywell Pressure / 5 <i>CFR 41.9/41.10</i>						4.4	Ability to recognize abnormal indications for system operating parameters which are <b>entry-level conditions for emergency and abnormal operating procedures</b> .	4.0	<b>MOD</b>	<b>11</b>	<b>444</b>
PAGE 1 TIER 1 GROUP 1 TOTAL	0	2	2	3	2	2	PAGE ONE TOTAL POINTS	11			

RIVER BEND STATION September 2004		BWR EXAMINATION OUTLINE EMERGENCY & ABNORMAL PLANT EVOLUTIONS - TIER 1 GROUP 1 (RO), continued						ES-401-1			
E/APE#/NAME/SAFETY FUNCTION <i>CFR REFERENCES</i>	K 1	K 2	K 3	A 1	A 2	G	K/A TOPIC(S)	IR	TYPE	QNO	QID
295025 High Reactor Pressure / 3 <i>CFR 41.5/43.1/43.2</i>					4		<b>Determine/interpret suppression pool level</b> as it applies to High Reactor Pressure.	3.9	NEW	12	948
295026 Supp. Pool High Water Temp. / 5 <i>CFR 41.6/41.9/41.10/43.5</i>			4				The <b>reasons for SBLC injection</b> as it applies to Suppression Pool High Water Temperature.	3.7	MOD	13	816
295027 High Containment Temperature / 5 <i>CFR 41.9/41.10/43.5</i>		4					The <b>interrelations between</b> High Containment Temperature and <b>ERIS</b> .	2.6	NEW	14	894
295028 High Drywell Temperature / 5 <i>CFR 41.5/41.7/41.14</i>	2						The <b>operational implications of equipment environmental qualification</b> as they apply to High Drywell Temperature.	2.9	BANK	15	895
295030 Low Suppression Pool Water Level / 5 <i>CFR 41.9/41.10/41.14</i>				3			<b>Operate/monitor HPCS</b> as it applies to Low Suppression Pool Water Level.	3.4	NEW	16	896
295031 Reactor Low Water Level / 2 <i>CFR 41.2/41.14/43.2</i>		16					The <b>interrelations between</b> Reactor Low Water Level and <b>Reactor Water Level Control</b> .	4.1	NEW	17	897
295037 SCRAM/Power >APRM Dnsc/Unkn / 1 <i>CFR 41.1/41.2/41.6/43.5/43.6</i>		8					The <b>interrelations between</b> Scram Condition Present and Reactor Power Above APRM Downscale or Unknown and <b>ERIS</b> .	2.7	NEW	18	898
295038 High Offsite Release Rate / 9 <i>CFR 41.7/41.13/43.4</i>						1.30	Ability to <b>locate and operate components, including local controls</b> .	3.9	NEW	19	886
600000 Plant Fire On Site / 8 <i>CFR 41.4/41.10/43.3</i>		1					The <b>interrelations between</b> Plant Fire On Site and <b>sensors, detectors and valves</b> .	2.6	NEW	20	923
PAGE 2 TIER 1 GROUP 1 TOTAL	1	4	1	1	1	1	PAGE TWO TOTAL POINTS	9			
PAGE 1 TIER 1 GROUP 1 TOTAL	0	2	2	3	2	2	PAGE ONE TOTAL POINTS	11			
<b>K/A CATEGORY TOTALS</b>	<b>1</b>	<b>6</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>TIER ONE GROUP ONE TOTAL</b>	<b>20</b>			

RIVER BEND STATION September 2004		BWR EXAMINATION OUTLINE EMERGENCY & ABNORMAL PLANT EVOLUTIONS - TIER 1 GROUP 2 (RO)						ES-401-1			
E/APE#/NAME/SAFETY FUNCTION <i>CFR REFERENCES</i>	K 1	K 2	K 3	A 1	A 2	G	K/A TOPIC(S)	IR	TYPE	QNO	QID
295009 Low Reactor Water Level / 2 <i>CFR 41.7</i>				2			<b>Operate/monitor Reactor Water Level Control</b> as it applies to Low Reactor Water Level.	4.0	MOD	21	954
295010 High Drywell Pressure / 5 <i>CFR 41.7</i>					2		<b>Determine/interpret drywell pressure</b> as it applies to High Drywell Pressure.	3.8	NEW	22	899
295011 High Containment Temperature / 5 <i>CFR 41.9/41.10/43.2</i>			1				The <b>reasons for increased containment cooling</b> as they apply to High Containment Temperature.	3.6	NEW	23	900
295012 High Drywell Temperature / 5 <i>CFR 41.9</i>						1.2	Knowledge of <b>operator responsibilities during all modes</b> of plant operation.	3.0	BANK 2003	24	901
295013 High Suppression Pool Temp. / 5 <i>CFR 41.9/41.10</i>	1						The <b>operational implications of pool stratification</b> as they apply to High Suppression Pool Temperature.	2.5	NEW	25	953
295034 Sec. CTMT Vent. High Radiation / 9 <i>CFR 41.9/41.11/41.13/43.4</i>			4				The <b>reasons for the Fuel Building Ventilation responses</b> as they apply to Secondary Containment Ventilation High Radiation.	3.7	NEW	26	903
295036 Sec. CTMT High Sump/Area Levels / 5 <i>CFR</i>	1						The <b>operational implications of radiation releases</b> as they apply to Secondary Containment High Sump/Area Water Level.	2.9	NEW	27	904
<b>K/A CATEGORY TOTALS</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>TIER ONE GROUP TWO TOTAL</b>	<b>7</b>			

## RIVER BEND STATION

September 2004

## BWR EXAMINATION OUTLINE

## PLANT SYSTEMS - TIER 2 GROUP 1 (RO)

ES-401-1

SYSTEM#/NAME CFR REFERENCE	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	TYPE	QNO	QID.
203000 RHR/LPCI Mode CFR 41.7/41.14					2							The operational implications of core cooling methods as applied to RHR/LPCI.	3.5	NEW	28	905
205000 Shutdown Cooling CFR 41.7/41.14		2										Electrical power supplies to motor operated valves.	2.5	MOD	29	906
209001 LPCS CFR 41.5/41.7/41.8/43.2			3									The effect a loss or malfunction of the LPCS will have on emergency generators.	2.9	MOD	30	819
209002 HPCS CFR 41.7							4					Predict/monitor changes in reactor pressure with operating HPCS controls.	3.3	NEW	31	907
211000 SLC CFR 41.6/41.7	2											The physical connections/cause-effect relationships between SLC and core plate ΔP indication.	2.7	NEW	32	1078
212000 RPS CFR 41.2/41.7						5						The effect that a loss or malfunction of the sensor inputs will have on the RPS.	3.5	NEW	33	885
215003 IRM CFR 41.2/41.7/43.6										7		Manually operate/monitor in the CR to verify proper functioning/operability.	3.6	BANK	34	29
215004 Source Range Monitor CFR 41.2/41.5						1						The effect a loss or malfunction of RPS will have on the SRMs.	3.2	NEW	35	908
215004 Source Range Monitor CFR 41.2/41.5							2					Predict/monitor changes in reactor power indication with operating the SRM controls.	3.6	NEW	36	799
215005 APRM / LPRM CFR 41.2/41.5						7						The effect a loss or malfunction of flow converter/comparator network will have on APRM/LPRM.	3.2	NEW	37	884
PAGE 1 TIER 2 GROUP 1 TOTAL	1	1	1	0	1	3	2	0	0	1	0	PAGE ONE TOTAL POINTS	10			

## RIVER BEND STATION

## BWR EXAMINATION OUTLINE

ES-401-1

September 2004

## PLANT SYSTEMS - TIER 2 GROUP 1 (RO), continued

SYSTEM#/NAME CFR REFERENCE	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	TYPE	QNO	QID.
215005 APRM / LPRM CFR 41.2/41.5			5									The effect a loss or malfunction of the APRM/LPRM will have on reactor power indication.	3.8	NEW	38	952
217000 RCIC CFR 41.5/41.7/41.8										5		Manually operate/monitor in the control room reactor water level.	3.2	NEW	39	943
217000 RCIC CFR 41.5/41.7/41.8											4.31	Knowledge of annunciators alarms and indications, and use of the response instructions.	3.3	BANK	40	820
218000 ADS CFR 41.7/41.8								6				Predict impacts of initiation signals present on the ADS; and use procedures to correct, control, or mitigate.	4.2	NEW	41	910
223002 PCIS / NSSSS CFR 41.7/41.9		1										Electrical power supplies to the logic power supplies ( <i>See NOTE below</i> ).	2.4	NEW	42	911
223002 PCIS / NSSSS CFR 41.7/41.9			7									The effect a loss or malfunction of the PCIS/NSSSS will have on reactor pressure.	3.7	NEW	43	912
239002 SRVs CFR 41.2/41.3/41.14							5					Predict/monitor changes in reactor water level associated with operating SRV controls.	3.7	NEW	44	913
259002 Rtr Water Level Control CFR 41.7	2											The physical connections/cause-effect relationships between Reactor Water Level Control and main steam flow.	3.2	NEW	45	941
261000 SGTS CFR											4.6	Knowledge symptom based EOP mitigation strategies.	3.1	NEW	46	812
PAGE 2 TIER 2 GROUP 1 TOTAL	1	1	2	0	0	0	1	1	0	1	2	PAGE TWO TOTAL POINTS	9			

NOTE: K/A statement 223002 has IR of 2.4 but is plant specific priority due to NSSSS logic being supplied by RPS power. RPS bus power transfer or loss will result in a Divisional isolation causing half of the BOP valves to close. This can have a significant impact on plant operation if not quickly identified and restored when operating at power.

RIVER BEND STATION

BWR EXAMINATION OUTLINE

ES-401-1

September 2004

PLANT SYSTEMS - TIER 2 GROUP 1 (RO), continued

SYSTEM#/NAME CFR REFERENCE	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	TYPE	QNO	QID.
262001 AC Distribution CFR 41.4/41.10/43.3								9				Predict the <b>impacts of exceeding voltage limitations</b> on AC Distribution; and use procedures to <b>correct, control, or mitigate</b> .	3.1	NEW	47	914
262001 AC Distribution CFR 41.4/41.10/43.3					1							The <b>operational implications</b> of the principle involved with <b>paralleling two AC sources</b> as applied to AC Distribution.	3.1	MOD	48	818
262002 UPS (AC/DC) CFR	1											The physical <b>connections/cause-effect</b> relationships between <b>UPS (AC/DC) and Feedwater Level Control</b> .	2.8	NEW	49	951
263000 DC Distribution CFR 41.4/41.5			3									The <b>effect a loss or malfunction</b> of the DC Distribution will have <b>on systems with DC components</b> .	3.4	BANK 2000	50	679
264000 EDGs CFR 41.7							9					<b>Predict/monitor maintaining minimum load</b> associated with operating EDG controls.	3.0	BANK	51	916
300000 Instrument Air CFR 41.4/41.7						12						The <b>effect a loss or malfunction</b> of the <b>breakers, relays and disconnects</b> will have on the Instrument Air System.	2.9	NEW	52	917
400000 Component Cooling Water CFR 41.4				1								<b>Design feature(s)/interlocks</b> which provide for <b>automatic start of standby pump</b> .	3.4	NEW	53	405
PAGE 3 TIER 2 GROUP 1 TOTAL	1	0	1	1	1	1	1	1	0	0	0	PAGE THREE TOTAL POINTS	7			
PAGE 2 TIER 2 GROUP 1 TOTAL	1	1	2	0	0	0	1	1	0	1	2	PAGE TWO TOTAL POINTS	9			
PAGE 1 TIER 2 GROUP 1 TOTAL	1	1	1	0	1	3	2	0	0	1	0	PAGE ONE TOTAL POINTS	10			
K/A CATEGORY TOTALS	3	2	4	1	2	4	4	2	0	2	2	TIER TWO GROUP ONE TOTAL	26			

RIVER BEND STATION

September 2004

BWR EXAMINATION OUTLINE

PLANT SYSTEMS - TIER 2 GROUP 2 (RO)

ES-401-1

SYSTEM#/NAME CFR REFERENCE	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	TYPE	QNO	QID.
201001 CRD Hydraulic CFR 41.6/41.7								14				Predict the <b>impacts of low drive header pressure</b> on CRDH; and use procedures to <b>correct, control, or mitigate</b> .	2.8	NEW	54	918
201003 Control Rod and CRDM CFR 41.2/41.5/41.6							2					<b>Predict/monitor changes in CRD drive pressure</b> with operating the CRDM controls.	2.8	NEW	55	813
201005 RCIS CFR 41.5/41.6/41.7/43.2/43.6	2											The physical <b>connections/cause-effect</b> relationships between <b>RCIS and the reactor pressure control system</b> .	3.3	NEW	56	811
202001 Recirculation CFR 41.7				9								<b>Design feature(s)/interlocks</b> which provide for <b>pump minimum flow limit</b> .	2.7	NEW	57	919
204000 RWCU CFR 41.4						5						The <b>effect a loss or malfunction of AC power</b> will have on RWCU.	2.6	NEW	58	920
239001 Main and Reheat Steam CFR 41.4/41.5										3		<b>Manually operate/monitor system flow</b> in the control room.	3.5	NEW	59	921
239003 MSIV Leakage Control CFR 41.7/41.9										7		<b>Manually operate/monitor status lights and alarms</b> in the control room.	2.8	NEW	60	922
245000 Turbine Gen. and Aux. CFR									10			<b>Monitor auto operations</b> of the Main Turbine Generator <b>output voltage/reactive load</b>	2.5	NEW	61	404
271000 Offgas CFR			1									The <b>effect a loss or malfunction</b> of the Offgas will have <b>on condenser vacuum</b> .	3.5	MOD	62	881
PAGE 1 TIER 2 GROUP 2 TOTAL	1	0	1	1	0	1	1	1	1	2	0	PAGE ONE TOTAL POINTS	9			



RIVER BEND STATION

BWR EXAMINATION OUTLINE

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PLANT SYSTEMS - TIER 2 GROUP 2 (RO), continued

SYSTEM#/NAME <i>CFR REFERENCE</i>	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	TYPE	QNO	QID.
286000 Fire Protection <i>CFR 41.4</i>									6			Monitor automatic operations of the Fire Protection System fire dampers.	3.0	BANK	63	167
288000 Plant Ventilation <i>CFR</i>						2						The effect a loss or malfunction of the applicable component cooling water system will have on the Plant Ventilation.	2.5	NEW	64	924
290003 Control Room HVAC <i>CFR</i>								3				Predict the impacts of initiation/reconfiguration failure on the Control Room HVAC; and use procedures to correct, control, or mitigate	3.4	BANK 2003	65	864
PAGE 2 TIER 2 GROUP 2 TOTAL	0	0	0	0	0	1	0	1	1	0	0	PAGE TWO TOTAL POINTS	3			
PAGE 1 TIER 2 GROUP 2 TOTAL	1	0	1	1	0	1	1	1	1	2	0	PAGE ONE TOTAL POINTS	9			
<b>K/A CATEGORY TOTALS</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>TIER TWO GROUP TWO TOTAL</b>	<b>12</b>			

## RIVER BEND STATION

September 2004

## BWR EXAMINATION OUTLINE

## GENERIC KNOWLEDGE AND ABILITIES - TIER 3 (RO)

ES-401-3

GENERIC CATEGORY <i>CFR REFERENCE</i>	K/A	K/A TOPIC(S)	IR	TYPE	QNO	QID.
2.1 CONDUCT OF OPERATIONS <i>CFR 41.7/43.2</i>	22	Ability to <b>determine Mode of Operation.</b>	2.8	MOD	66	870
2.1 CONDUCT OF OPERATIONS <i>CFR 41.7</i>	24	Ability to <b>obtain and interpret station electrical and mechanical drawings.</b>	2.8	MOD	67	925
2.1 CONDUCT OF OPERATIONS <i>CFR 41.10</i>	29	Knowledge of how to <b>conduct and verify valve lineups.</b>	3.4	BANK	68	949
SUBTOTAL	<b>3</b>					
2.2 EQUIPMENT CONTROL <i>CFR 41.10</i>	12	Knowledge of <b>surveillance procedures.</b>	3.0	BANK 2003	69	164
2.2 EQUIPMENT CONTROL <i>CFR 41.10/43.2/43.6</i>	26	Knowledge of <b>refueling administrative requirements.</b>	2.5	NEW	70	927
SUBTOTAL	<b>2</b>					
2.3 RADIATION CONTROL <i>CFR 41.10/41.12/43.4</i>	4	Knowledge of radiation <b>exposure limits and contamination control</b> , including <b>permissible levels in excess of those authorized.</b>	2.5	BANK	71	434
2.3 RADIATION CONTROL <i>CFR 41.11/41.12/43.4</i>	11	Ability to <b>control radiation releases.</b>	2.7	NEW	72	955
SUBTOTAL	<b>2</b>					
2.4 EMERGENCY PROCEDURES / PLAN <i>CFR 41.10/43.5</i>	8	Knowledge of <b>how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom-based EOPs.</b>	3.0	NEW	73	928
2.4 EMERGENCY PROCEDURES / PLAN <i>CFR 41.10/43.5</i>	18	Knowledge of the <b>specific bases for EOPs.</b>	2.7	BANK	74	210
2.4 EMERGENCY PROCEDURES / PLAN <i>CFR 41.10/43.5</i>	50	Ability to <b>verify system alarm setpoints and operate controls</b> identified in the <b>alarm response manual.</b>	3.3	NEW	75	852
SUBTOTAL	<b>3</b>					
<b>TIER THREE POINT TOTAL</b>	<b>10</b>					

## RIVER BEND STATION

## BWR EXAMINATION OUTLINE

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## EMERGENCY &amp; ABNORMAL PLANT EVOLUTIONS - TIER 1 GROUP 1 (SRO)

E/APE#/NAME/SAFETY FUNCTION <i>CFR REFERENCES</i>	K 1	K 2	K 3	A 1	A 2	G	K/A TOPIC(S)	IR	TYPE	QNO	QID
295001 Loss of Forced Core Circulation / 1 & 4 <i>CFR 41.3/41.5/41.6/41.14/43.1/43.2</i>						2.25	Knowledge of <b>bases</b> in technical specifications for <b>limiting conditions for operations and safety limits</b> .	3.7	<b>BANK 2003</b>	<b>76</b>	<b>833</b>
295003 Partial or Total Loss of AC Power / 6 <i>CFR 41.8-41.10/43.5</i>					2		<b>Determine/interpret reactor power, pressure, and level</b> as they apply to Partial or Complete Loss of AC Power.	4.3	<b>NEW</b>	<b>77</b>	<b>217</b>
295005 Main Turbine Generator Trip / 3 <i>CFR 41.4/43.5</i>					8		<b>Determine/interpret electrical distribution status</b> as it applies to Main Turbine Generator Trip.	3.3	<b>NEW</b>	<b>78</b>	<b>200</b>
295006 SCRAM / 1 <i>CFR 41.10/43.5</i>	3						<b>Operational implications of reactivity control</b> as it applies to SCRAM.	4.0	<b>NEW</b>	<b>79</b>	<b>814</b>
295018 Partial or Total Loss of CCW / 8 <i>CFR 41.4/43.5</i>				1			<b>Operate/monitor backup systems</b> as they apply to Partial or Complete Loss of Component Cooling Water.	3.4	<b>NEW</b>	<b>80</b>	<b>229</b>
295019 Partial or Total Loss of Inst. Air / 8 <i>CFR 41.741.10/43.1/43.2</i>						1.33	Ability to recognize indications for system operating parameters which are <b>entry-level conditions for technical specifications</b> .	4.0	<b>MOD</b>	<b>81</b>	<b>815</b>
295025 High Reactor Pressure / 3 <i>CFR 41.5/43.1/43.2</i>						4.30	Knowledge of <b>which events</b> related to system operations/status <b>should be reported to outside agencies</b> .	3.6	<b>MOD</b>	<b>82</b>	<b>931</b>
295028 High Drywell Temperature / 5 <i>CFR 41.5/41.7/41.14/43.5</i>						1.23	Ability to <b>perform specific system and integrated plant procedures during different modes</b> of plant operation.	4.0	<b>NEW</b>	<b>83</b>	<b>932</b>
<b>K/A CATEGORY TOTALS</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>TIER ONE GROUP ONE TOTAL</b>	<b>8</b>			

## RIVER BEND STATION

## BWR EXAMINATION OUTLINE

ES-401-1

September 2004

## EMERGENCY &amp; ABNORMAL PLANT EVOLUTIONS - TIER 1 GROUP 2 (SRO)

E/APE#/NAME/SAFETY FUNCTION <i>CFR REFERENCES</i>	K 1	K 2	K 3	A 1	A 2	G	K/A TOPIC(S)	IR	TYPE	QNO	QID
295020 Inadvertent Containment Isolation / 5 <i>CFR 41.9/41.11/41.13/43.5</i>			2				The reasons for Drywell/containment pressure response as they apply to Inadvertent Containment Isolation.	3.5	NEW	84	933
295032 High Sec. CTMT Area Temperature / 5 <i>CFR 41.9/43.5</i>			2				The reasons for reactor SCRAM as they apply to High Secondary Containment Area Temperature.	3.8	NEW	85	934
295035 Sec. CTMT Vent. High ΔP / 5 <i>CFR 41.9/43.4</i>					1		Determine/interpret secondary containment pressure as it applies to Secondary Containment High Differential Pressure.	3.9	NEW	86	950
500000 High Containment Hydrogen Conc. / 5 <i>CFR 41.7-41.10/43.5</i>					4		Determine/interpret combustible limits for wetwell as they apply to High Primary Containment Hydrogen Concentrations.	3.3	BANK 2000	87	674
<b>K/A CATEGORY TOTALS</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>TIER ONE GROUP TWO TOTAL</b>	<b>4</b>			

RIVER BEND STATION

BWR EXAMINATION OUTLINE

ES-401-1

September 2004

PLANT SYSTEMS - TIER 2 GROUP 1 (SRO)

SYSTEM#/NAME <i>CFR REFERENCE</i>	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	TYPE	QNO	QID.
205000 Shutdown Cooling <i>CFR 41.7/41.1/43.2</i>											1.14	Knowledge of <b>system status criteria</b> which require the <b>notification of plant personnel</b> .	3.3	NEW	88	936
212000 RPS <i>CFR 41.2/41.7/43.5</i>								21				Predict the <b>impacts of the failure of individual relays to reposition</b> on RPS; and use procedures to <b>correct, control, or mitigate</b> .	3.9	NEW	89	937
263000 DC Distribution <i>CFR 41.6/41.7</i>											1.32	Ability to <b>explain and apply system limits and precautions</b> .	3.8	NEW	90	946
264000 EDGs <i>CFR 41.7/43.2</i>								3				Predict the <b>impacts of operating unloaded, lightly loaded, and highly loaded</b> on the EDGs; and use procedures to <b>correct, control, or mitigate</b> .	3.4	NEW	91	232
<b>K/A CATEGORY TOTALS</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>TIER TWO GROUP ONE TOTAL</b>	<b>4</b>			

**RIVER BEND STATION**

**BWR EXAMINATION OUTLINE**

**ES-401-1**

**September 2004**

**PLANT SYSTEMS - TIER 2 GROUP 2 (SRO)**

<b>SYSTEM#/NAME CFR REFERENCE</b>	<b>K 1</b>	<b>K 2</b>	<b>K 3</b>	<b>K 4</b>	<b>K 5</b>	<b>K 6</b>	<b>A 1</b>	<b>A 2</b>	<b>A 3</b>	<b>A 4</b>	<b>G</b>	<b>K/A TOPIC(S)</b>	<b>IR</b>	<b>TYPE</b>	<b>QNO</b>	<b>QID.</b>
234000 Fuel Handling Equipment <i>CFR 41.6/41.7/43.7</i>									2			<b>Monitor auto operations</b> of Fuel Handling Equipment including <b>interlock operation</b> .	3.7	<b>MOD</b>	<b>92</b>	<b>882</b>
290002 Reactor Vessel Internals <i>CFR 43.4/43.6</i>			4									The <b>effect a loss or malfunction</b> of the Reactor Vessel Internals will have <b>on plant radiation levels</b> .	3.2	<b>MOD</b>	<b>93</b>	<b>940</b>
<b>K/A CATEGORY TOTALS</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>TIER TWO GROUP TWO TOTAL</b>	<b>2</b>			

<b>RIVER BEND STATION</b>		<b>BWR EXAMINATION OUTLINE</b>				<b>ES-401-3</b>	
<b>September 2004</b>		<b>GENERIC KNOWLEDGE AND ABILITIES - TIER 3 (SRO)</b>					
<b>GENERIC CATEGORY CFR REFERENCE</b>	<b>K/A</b>	<b>K/A TOPIC(S)</b>	<b>IR</b>	<b>TYPE</b>	<b>QNO</b>	<b>QID.</b>	
2.1 CONDUCT OF OPERATIONS <i>CFR 43.4</i>	1	Knowledge of <b>conduct of operations requirements.</b>	3.8	<b>BANK</b>	<b>94</b>	<b>1063</b>	
2.1 CONDUCT OF OPERATIONS <i>CFR 43.2</i>	2	Knowledge of <b>operator responsibilities during all modes of plant operation.</b>	4.0	<b>MOD</b>	<b>95</b>	<b>624</b>	
SUBTOTAL	<b>2</b>						
2.2 EQUIPMENT CONTROL <i>CFR 41.10/43.3</i>	5	Knowledge of the <b>process for making changes in the facility as described in the SAR.</b>	2.7	<b>NEW</b>	<b>96</b>	<b>876</b>	
2.2 EQUIPMENT CONTROL <i>CFR 41.10/43.3/43.5</i>	22	Knowledge of <b>limiting conditions for operations and safety limits.</b>	4.1	<b>NEW</b>	<b>97</b>	<b>926</b>	
SUBTOTAL	<b>2</b>						
2.3 RADIATION CONTROL <i>CFR 41.11/41.12/43.4</i>	1	Knowledge of <b>10 CFR 20 and related facility radiation control requirements.</b>	3.0	<b>MOD</b>	<b>98</b>	<b>632</b>	
SUBTOTAL	<b>1</b>						
2.4 EMERGENCY PROCEDURES / PLAN <i>CFR 41.10/43.5</i>	5	Knowledge of the <b>organization of the operating procedures network for normal, abnormal, and emergency evolutions.</b>	3.6	<b>MOD</b>	<b>99</b>	<b>675</b>	
2.4 EMERGENCY PROCEDURES / PLAN <i>CFR 41.10/43.6</i>	21	Knowledge of the <b>parameters and logic used to assess the status of safety functions</b> including (1) Reactivity control (2) Core cooling and heat removal (3) Reactor coolant system integrity (4) Containment conditions (5) Radioactivity release control.	4.3	<b>MOD</b>	<b>100</b>	<b>370</b>	
SUBTOTAL	<b>2</b>						
<b>TIER THREE TOTAL</b>	<b>7</b>						

Facility: <b>RIVER BEND STATION</b> Date of Exam: <b>9/17/2004</b> Exam Level: <b>RO</b> Page <b>1</b>		
<b>Tier / Group</b>	<b>Randomly Selected KA</b>	<b>Reason for Rejection</b>
1/1	295024, G 2.4.30	RO IR is 2.2 (<2.5) with no site-specific priority justification. Randomly selected replacement KA statement, G 2.4.4.
1/1	295038, G 2.2.25	Moved to SRO Tier 1 Group 1 topic 295001 (See SRO Record of Rejected K/As). Replaced with KA statement G 2.1.30, randomly selected for SRO topic 295001.
1/1	600000, AK2.02	RO IR is 2.4 (<2.5) with no site-specific priority justification. Randomly selected replacement KA statement, AK2.01.
1/2	295012, G 2.1.27	KA statement "Knowledge of system purpose and or function" is inappropriate for Hi DW Temperature abnormal evolution. Randomly selected replacement KA statement, G 2.1.2.
2/1	211000, K1.08	RO IR is 2.3 (<2.5) with no site-specific priority justification. Randomly selected replacement KA statement, K1.02.
2/1	215005, K6.05	Not a feature of River Bend. A loss or malfunction of IRMs does not affect the APRMs or LPRMs. Randomly selected replacement KA statement, K6.07.
2/1	215005, K3.06	Not a feature of River Bend. A loss or malfunction of APRMs or LPRMs does not affect the IRMs. Randomly selected replacement KA statement, K3.08. Rejected this KA on the basis of it being beyond the scope of RO responsibilities at River Bend to determine the effect that an LPRM failure will have on core thermal calculations. No River Bend RO task supports requiring this knowledge. The RO's responsibility at River Bend is limited to the ability to identify thermal limit values calculated by the Core Monitoring System that require LCO entry. This ability is evaluated in the RO ADMIN - 1 JPM, <b>RJPM-OPS-ADM-R01</b> . Randomly selected replacement KA statement, K3.05.



Facility: <b>RIVER BEND STATION</b> Date of Exam: <b>9/17/2004</b> Exam Level: <b>RO</b> Page <b>2</b>		
<b>Tier / Group</b>	<b>Randomly Selected KA</b>	<b>Reason for Rejection</b>
2/1	262002, K1.11	Question 49 developed and submitted in exam materials was rejected as too simple with use of AOP attachments. All River Bend Control Room Recorders are fed from UPS and operators are not expected to have UPS power sources to each recorder memorized. It was determined that a question of suitable difficulty to be discriminating at the RO level could not be developed for this KA.  Randomly selected replacement KA statement, K1.01
2/1	300000, K6.11	RO IR is 2.3 (<2.5) with no site-specific priority justification.  Randomly selected replacement KA statement, K6.04 and rejected this KA to avoid double jeopardy with exam item for KA 295019 A1.04. Service Air Refusal valve is one of two auto valves in air systems. In order to develop a sufficiently discriminating question for either KA requires using both automatic valves in the question.  Randomly selected replacement KA statement, K6.12
2/2	288000, K2.01	RO IR is 2.4 (<2.5) with no site-specific priority justification. Also, the only remaining statement in this category, K2.02 has RO IR of 1.8 (<2.5) with no site-specific priority justification.  Randomly selected new KA category and statement, K6.02.
3/	G 2.1.8	This ability is evaluated in the simulator part of the operating test.  Randomly selected replacement KA statement, G 2.1.22.
3/	G 2.1.26	RO IR is 2.2 (<2.5) with no site-specific priority justification.  Randomly selected replacement KA statement, G 2.1.16, which was also rejected due to it being evaluated in the simulator part of the operating test.  Randomly selected replacement KA statement, G 2.1.24.
3/	G 2.2.22	Exam question submitted was questioned by NRC reviewers as an SRO-only may not be appropriate for RO exam. Facility agreed and moved question and KA to the SRO exam to replace rejected SRO-only exam question for SRO KA 2.2.20 in same Generic Category of Tier 3.  Randomly selected replacement KA statement for RO, G 2.2.12.

Facility: <b>RIVER BEND STATION</b> Date of Exam: <b>9/17/2004</b> Exam Level: <b>RO</b> Page <b>3</b>		
<b>Tier / Group</b>	<b>Randomly Selected KA</b>	<b>Reason for Rejection</b>
3/	G 2.3.8	RO IR is 2.3 (<2.5) with no site-specific priority justification. Randomly selected replacement KA statement, G 2.3.11.
3/	G 2.4.33	RO IR is 2.4 (<2.5) with no site-specific priority justification. Randomly selected replacement KA statement, G 2.2.18.

Facility: <b>RIVER BEND STATION</b> Date of Exam: <b>9/17/2004</b> Exam Level: <b>SRO</b> Page <b>1</b>		
<b>Tier / Group</b>	<b>Randomly Selected KA</b>	<b>Reason for Rejection</b>
1/1	295001, G 2.1.30	KA statement "Ability to locate and operate components, including local controls" is inappropriate for SRO-only knowledge level. Moved KA statement G 2.1.30 to RO Tier 1 Group 1 topic 295038 (See RO Record of Rejected K/As). Replaced with RO randomly selected KA statement, G 2.2.25 which is SRO-only knowledge.
1/1	295003, AA1.02	The KA selected is inappropriate for developing a psychometrically sound question that adequately discriminates at the SRO level. Randomly selected replacement KA statement, AA2.02.
1/1	295005, AA2.02	The KA selected is inappropriate for developing a psychometrically sound question that adequately discriminates at the SRO level. Turbine Vibration as it applies to Turbine Trip does not have multiple procedures to from which to choose nor any applicable Technical Specifications from which to develop an SRO-only question. Randomly selected replacement KA statement, AA2.08.
1/1	295006, AA1.01	The KA selected is inappropriate for developing a psychometrically sound question that adequately discriminates at the SRO level. Randomly selected replacement KA statement, AK1.03.
1/1	295028, G 2.1.27	KA statement "Knowledge of system purpose and or function" is inappropriate for Hi DW Temperature emergency evolution. Also, the K/A statement is inappropriate for SRO-only knowledge level. Randomly selected replacement KA statement, G 2.1.23.
2/1	263000, K4.01	River Bend does not have features or interlocks as part of the D.C. Electrical Distribution System that provide for manual or automatic transfer of control. Randomly selected replacement KA statement, G 2.1.32.
3/	G 2.2.20	Question submitted for KA was rejected by NRC review as not at SRO-only level. Determined it would take excessive amount of time to develop a suitable replacement question for this KA, "Knowledge of the process for managing troubleshooting activities."  Replaced question with RO question that was removed from RO exam because it was determined to be at SRO level. Replacement KA is G 2.2.22, randomly selected originally for RO exam.

Facility: <b>RIVER BEND STATION</b> Date of Exam: <b>9/17/2004</b> Exam Level: <b>SRO</b> Page <b>2</b>		
<b>Tier / Group</b>	<b>Randomly Selected KA</b>	<b>Reason for Rejection</b>
3/	G 2.4.41	Knowledge of EAL thresholds and classifications will be evaluated in SRO Admin JPM (960-01). Randomly selected replacement KA statement, G 2.4.5.

Facility: <b>RIVER BEND STATION</b> Date of Examination: 9/20/2004 – 9/24/2004 Examination Level: <u>    <b>RO</b>    </u> Operating Test Number: <u>    <b>1</b>    </u>				
<b>Admin Topic</b> <i>(Type Code*)</i> Exam JPM No.	<b>Description of activity to be performed</b>  K/A Statement(s)	KA	IR	Notes
<b>Conduct of Operations</b>  <i>(M) (A)</i> ADM-R01	<b>Complete the Daily Logs verification of power distribution limits during Single Loop Operation</b>  Use plant computer to obtain and evaluate parametric information on system or component status.	2.1.19	3.0	
<b>Conduct of Operations</b>  <i>(M)</i> ADM-R02	<b>Determine Primary Containment water level and correlated RPV water level per EOP Enclosure 23</b>  Ability to perform specific system and integrated plant procedures during different modes of plant operation.	2.1.23	3.9	
<b>Equipment Control</b>  <i>(N)</i> ADM-R03	<b>Identify required tags and hanging sequence for SLC Pump Relief Valve removal and replacement.</b>  Knowledge of tagging and clearance procedures.	2.2.13	3.6	
<b>Radiation Control</b>  <i>(N) (A)</i> ADM-RS04	<b>Enter and exit a High Radiation Area for a valve lineup.</b>  Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.3.10	2.9	
* Type Codes: <i>(D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path</i>				

Facility: <b>RIVER BEND STATION</b> Date of Examination: 9/20/2004 – 9/24/2004 Examination Level: <u>    <b>SRO</b>    </u> Operating Test Number: <u>    <b>1</b>    </u>				
<b>Admin Topic</b> <i>(Type Code*)</i> Exam JPM No.	<b>Description of activity to be performed</b>  K/A Statement(s)	KA	IR	Notes
<b>Conduct of Operations</b>  (N) (A) ADM-S01	<b>Determine Alternate Decay Heat Removal Method</b>  Ability to obtain and interpret station reference materials such as graphs / monographs / and tables which contain performance data.	2.1.25	3.1	
<b>Conduct of Operations</b>  (N) ADM-S02	<b>Complete LCO Status Sheet for inoperable Control Room Fresh Air initiation instrumentation.</b>  Ability to apply technical specifications for a system.	2.1.12	4.0	
<b>Equipment Control</b>  (N) (A) ADM-S03	<b>Review completed Quarterly SLC Pump and Valve Operability surveillance procedure for approval.</b>  Knowledge of surveillance procedures.	2.2.12	3.4	
<b>Radiation Control</b>  (N) (A) ADM-RS04	<b>Enter and exit a High Radiation Area for a valve lineup.</b>  Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.3.10	3.3	
<b>Emergency Plan</b>  (M) ADM-S05	<b>Classify an Emergency Event</b>  Knowledge of emergency action level thresholds and classifications.	2.4.41	4.1	
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path				

Facility: <b>RIVER BEND STATION</b> Examination Level: <b>RO</b>		Date of Examination: <b>9/20/2004 – 9/24/2004</b> Operating Test Number: <b>1</b>		
CONTROL ROOM SYSTEMS (8 for RO)				
System / JPM Title and No. / (Type Codes*)	SF	KA	IR	Notes
1. 201005 Rod Control and Information System 295037 SCRAM and Reactor Power Above APRM Downscale or Unknown <b>Defeat RCIS Interlocks Per EOP Enclosure                  14</b> <b>Exam JPM No. CRS-01 (D) (C)</b>	7	K1.02 K5.02 A1.01 EK2.12 EA1.08	3.3 2.8 3.2 3.6 3.6	
2. 400000 Component Cooling Water System <b>CCP Valve Quarterly Stroke Test                  Surveillance</b> <b>Exam JPM No. CRS-02 (N) (A) (S)</b>	8	K1.01 A4.01 AK3.07 AA1.01	3.2 3.1 3.1 3.3	Loss of Normal Service Water creates Alternate Path requiring action to allow initiation of Standby Service Water.
3. 223001 Primary Containment and Auxiliaries <b>Makeup to Suppression Pool Using                  SPC/ADHR</b> <b>Exam JPM No. CRS-03 (M) (A) (S)</b>	5	K1.13 A2.11	3.4 3.6	Failure of RHS-AOV63 creates Alternate Path requiring use of HPCS for SP makeup.
4. 259002 Reactor Water Level Control System <b>Place FWRV 'C' in service on Master                  FWLC with Startup FWRV</b> <b>Exam JPM No. CRS-04 (M) (A) (S) (L)</b>	2	K5.01 A1.05 A4.03	3.1 2.9 3.8	Failure of FWRC 'C' to open creates Alternate Path requiring selection of alternate FWRV
5. 239001 Main and Reheat Steam System <b>Bypass MSR Steam Supply Valves Interlock                  per EOP Enclosure 5</b> <b>Exam JPM No. CRS-05 (D) (C)</b>	3	K1.01 K1.05	3.4 2.8	
6. 288000 Plant Ventilation System <b>Restore Fuel Building Ventilation to                  Standby Following Auto Initiation.</b> <b>Exam JPM No. CRS-06 (D) (S)</b>	9	K4.03 A2.01 A4.01	2.8 3.3 3.1	
* 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 entry				

Facility: <b>RIVER BEND STATION</b> Examination Level: <b>RO</b>		Date of Examination: <b>9/20/2004 – 9/24/2004</b> Operating Test Number: <b>1</b>		
CONTROL ROOM SYSTEMS, continued (8 for RO)				
System / <b>JPM Title and No.</b> / (Type Codes*)	SF	KA	IR	Notes
7. 262001 AC Electrical Distribution 295003 Partial/Complete Loss of AC Power <b>Parallel Offsite Power to ENS-SWG1B Supplied by Div II EDG</b> <b>Exam JPM No. CRS-07 (M) (A) (S) (L)</b>	6	A2.01 A2.05 A4.02 AA1.02	3.5 3.6 3.4 4.2	Generator Ground condition creates Alternate Path requiring manual trip of O/P breaker and Diesel shutdown.
8. 201003 Control Rod and Drive Mechanism <b>Perform Control Rod Operability Check</b> <b>Exam JPM No. CRS-08 (D) (A) (S)</b>	1	K4.02 A2.02 A4.02	3.8 3.7 3.5	Control Rod Overtravel alarm indicating uncoupled rod, creates the Alternate Path.
IN-PLANT SYSTEMS (3 for RO)				
1. 201001 Control Rod Drive Hydraulic System 295037 SCRAM and Reactor Power Above APRM Downscale or Unknown <b>Vent Scram Air Header per EOP Enclosure 11</b> <b>Exam JPM No. IPS-01 (D) (R)</b>	1	K1.09 EK3.07	3.1 4.2	Requires CAA and Primary Containment entry.
2. 264000 Emergency Diesel Generators 295016 Control Room Abandonment <b>Place Standby Service Water in service for Div I EDG from Remote Shutdown Panel</b> <b>Exam JPM No. IPS-02 (D) (A) (L)</b>	6	K6.07 AK2.01 AK2.02	3.8 4.4 4.0	Trip of SWP-P2A creates Alternate Path requiring start of SWP-P2C from different panel (EGS-PNL4C)
3. 212000 Reactor Protection System <b>Restore RPS B Normal power supply.</b> <b>Exam JPM No. IPS-03 (D)</b>	7	K1.04 K2.01 A1.01 A2.01	3.4 3.2 2.8 3.7	
* 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 entry				



Facility: <b>RIVER BEND STATION</b> Examination Level: <b>SRO-Instant</b>		Date of Examination: <b>9/20/2004 – 9/24/2004</b> Operating Test Number: <b>1</b>		
CONTROL ROOM SYSTEMS (7 for SRO-I)				
System / JPM Title and No. / (Type Codes*)	SF	KA	IR	Notes
1. 201005 Rod Control and Information System 295037 SCRAM and Reactor Power Above APRM Downscale or Unknown <b>Defeat RCIS Interlocks Per EOP Enclosure                  14</b> <b>Exam JPM No. CRS-01 (D) (C)</b>	7	K1.02 K5.02 A1.01 EK2.12 EA1.08	3.5 3.3 3.3 3.8 3.6	
2. 400000 Component Cooling Water System <b>CCP Valve Quarterly Stroke Test                  Surveillance</b> <b>Exam JPM No. CRS-02 (N) (A) (S)</b>	8	K1.01 A4.01 AK3.07 AA1.01	3.3 3.0 3.2 3.4	Loss of Normal Service Water creates Alternate Path requiring action to allow initiation of Standby Service Water.
3. 223001 Primary Containment and Auxiliaries <b>Makeup to Suppression Pool Using                  SPC/ADHR</b> <b>Exam JPM No. CRS-03 (M) (A) (S)</b>	5	K1.13 A2.11	3.5 3.8	Failure of RHS-AOV63 creates Alternate Path requiring use of HPCS for SP makeup.
4. 259002 Reactor Water Level Control System <b>Place FWRV 'C' in service on Master                  FWLC with Startup FWRV</b> <b>Exam JPM No. CRS-04 (M) (A) (S) (L)</b>	2	K5.01 A1.05 A4.03	3.1 2.9 3.6	Failure of FWRC 'C' to open creates Alternate Path requiring selection of alternate FWRV
5. 239001 Main and Reheat Steam System <b>Bypass MSR Steam Supply Valves Interlock                  per EOP Enclosure 5</b> <b>Exam JPM No. CRS-05 (D) (C)</b>	3	K2.01 K4.05 K6.04 A2.03	3.2 3.7 3.2 4.2	
6. 288000 Plant Ventilation System <b>Restore Fuel Building Ventilation to                  Standby Following Auto Initiation.</b> <b>Exam JPM No. CRS-06 (D) (S)</b>	9	K4.03 A2.01 A4.01	2.9 3.4 2.9	
* 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 entry				

Facility: <b>RIVER BEND STATION</b> Examination Level: <b>SRO-Instant</b>		Date of Examination: <b>9/20/2004 – 9/24/2004</b> Operating Test Number: <b>1</b>		
CONTROL ROOM SYSTEMS, continued (7 for SRO-I)				
System / <b>JPM Title and No.</b> / (Type Codes*)	SF	KA	IR	Notes
7. 262001 AC Electrical Distribution 295003 Partial/Complete Loss of AC Power <b>Parallel Offsite Power to ENS-SWG1B Supplied by Div II EDG</b> <b>Exam JPM No. CRS-07 (M) (A) (S) (L)</b>	6	A2.01 A2.05 A4.02 AA1.02	3.6 3.6 3.4 4.3	Generator Ground condition creates Alternate Path requiring manual trip of O/P breaker and Diesel shutdown.
IN-PLANT SYSTEMS (3 for SRO-I)				
1. 201001 Control Rod Drive Hydraulic System 295037 SCRAM and Reactor Power Above APRM Downscale or Unknown <b>Vent Scram Air Header per EOP Enclosure 11</b> <b>Exam JPM No. IPS-01 (D) (R)</b>	1	K1.09 EK3.07	3.2 4.3	Requires CAA and Primary Containment entry.
2. 264000 Emergency Diesel Generators 295016 Control Room Abandonment <b>Place Standby Service Water in service for Div I EDG from Remote Shutdown Panel</b> <b>Exam JPM No. IPS-02 (D) (A) (L)</b>	6	K6.07 AK2.01 AK2.02	3.9 4.5 4.1	Trip of SWP-P2A creates Alternate Path requiring start of SWP-P2C from different panel (EGS-PNL4C)
3. 212000 Reactor Protection System <b>Restore RPS B Normal power supply.</b> <b>Exam JPM No. IPS-03 (D)</b>	7	K1.04 K2.01 A1.01 A2.01	3.6 3.3 2.9 3.9	
* 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 entry				

Facility: <b>RIVER BEND STATION</b> Examination Level: <b>SRO-Upgrade</b>		Date of Examination: <b>9/20/2004 – 9/24/2004</b> Operating Test Number: <b>1</b>		
CONTROL ROOM SYSTEMS (2 or 3 for SRO-U)				
System / <b>JPM Title and No.</b> / (Type Codes*)	SF	KA	IR	Notes
1. 201005 Rod Control and Information System 295037 SCRAM and Reactor Power Above APRM Downscale or Unknown <b>Defeat RCIS Interlocks Per EOP Enclosure 14</b> <b>Exam JPM No. CRS-01 (D) (C)</b>	7	K1.02 K5.02 A1.01 EK2.12 EA1.08	3.5 3.3 3.3 3.8 3.6	
2. 400000 Component Cooling Water System <b>CCP Valve Quarterly Stroke Test Surveillance</b> <b>Exam JPM No. CRS-02 (N) (A) (S)</b>	8	K1.01 A4.01 AK3.07 AA1.01	3.3 3.0 3.2 3.4	Loss of Normal Service Water creates Alternate Path requiring action to allow initiation of Standby Service Water.
3. 223001 Primary Containment and Auxiliaries <b>Makeup to Suppression Pool Using SPC/ADHR</b> <b>Exam JPM No. CRS-03 (M) (A) (S)</b>	5	K1.13 A2.11	3.5 3.8	Failure of RHS-AOV63 creates Alternate Path requiring use of HPCS for SP makeup.
IN-PLANT SYSTEMS (3 or 2 for SRO-U)				
1. 201001 Control Rod Drive Hydraulic System 295037 SCRAM and Reactor Power Above APRM Downscale or Unknown <b>Vent Scram Air Header per EOP Enclosure 11</b> <b>Exam JPM No. IPS-01 (D) (R)</b>	1	K1.09 EK3.07	3.2 4.3	Requires CAA and Primary Containment entry.
2. 264000 Emergency Diesel Generators 295016 Control Room Abandonment <b>Place Standby Service Water in service for Div I EDG from Remote Shutdown Panel</b> <b>Exam JPM No. IPS-02 (D) (A) (L)</b>	6	K6.07 AK2.01 AK2.02	3.9 4.5 4.1	Trip of SWP-P2A creates Alternate Path requiring start of SWP-P2C from different panel (EGS-PNL4C)
* 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 entry				

Facility: <b>RIVER BEND STATION</b> Examination Level: <b>ALL (Backup JPM)</b>		Date of Examination: <b>9/20/2004 – 9/24/2004</b> Operating Test Number: <b>1</b>		
CONTROL ROOM SYSTEMS				
IN-PLANT SYSTEMS				
System / <b>JPM Title and No.</b> / <i>(Type Codes*)</i>	SF	KA	IR RO/SRO	Notes
1. 223002 Containment Isolation System 500000 High Containment Hydrogen Conc. <b>Perform emergency containment venting for high H<sub>2</sub> concentration per EOP Enclosure 21</b> <b>Exam JPM No. BU-02 (D) (R) (L)</b>	5	K1.10 K4.08 EK1.01	3.1/3.2 3.3/3.7 3.3/3.9	
* <i>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 entry</i>				

<b>Facility:</b> <u>River Bend Station</u>	<b>Scenario No.:</b> <u>1 (SIS-19.0, IC-163)</u> <b>NEW SCENARIO</b>	<b>Op.-Test No.:</b> <u>1</u>
<b>Examiners:</b> _____ _____ _____	<b>Operators:</b> <u>CRS – Control Room Suprv. (SRO)</u> <u>ATC – At-the-Controls (RO)</u> <u>UO – Unit Operator (BOP-RO)</u>	
<b>Initial Conditions:</b> Plant startup in progress at 40% power. Reactor Recirc pumps were shifted to fast speed last shift. Reactor Engineering has requested that reactor power be raised with recirc flow to raise core flow to 50%.		
<b>Turnover:</b> APRM 'C' INOP and bypassed due to power supply failure. Heater Drain Pumps, HDL-P1A and C tagged out due to excessive leakage. Main Generator voltage regulator in Manual due to erratic operation in Auto. Continue plant startup by raising core flow with Recirc flow control valves per Reactor Engineer request.		

Event No.	Malf. No.	Event Type *	Event Description
<b>1</b> T = 0 min.	N/A	R (ATC)	Raise power and core flow with recirc flow control valves
<b>2</b> T = 8 min.	CRD001B	C (UO/CRS)	CRD Pump B trip.
	CRDM4813(2)	I (ATC/CRS)	Accumulator instrument failure causes accumulator trouble to not clear when CRD Pump A is started. <i>(Tech Specs for CRS)</i>
<b>3</b> T = 20 min.	CRDM2405(1)	C (ATC/CRS)	Control Rod Drifts out. <i>(Tech Spec for CRS)</i>
<b>4</b> T = 30 min.	RPS003B	C (ALL)	Loss of RPS B
<b>5</b> T = 40 min.	FWS007C	I (ATC/CRS)	FWRV 'C' control signal fails high failing FWRV open.
<b>Automatic scram signal will be initiated on (or manual scram signal before reaching) high reactor water level.</b>			
<b>6</b> T = 40 min	CRD014	M (ALL)	Hydraulic ATWS
<b>7</b> T = 42 min.	RCIC003	C (UO/CRS)	RCIC flow controller fails low. <i>(After EOP Entry)</i>

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

<b>Facility:</b> <u>River Bend Station</u>	<b>Scenario No.:</b> <u>2 (SIS-21.0, IC-165)</u>	<b>Op.-Test No.:</b> <u>1</u>	
<b>MODIFIED SCENARIO</b>			
<b>Examiners:</b> _____ _____ _____	<b>Operators:</b> <u>CRS – Control Room Suprv. (SRO)</u> <u>ATC – At-the-Controls (RO)</u> <u>UO – Unit Operator (BOP-RO)</u>		
<b>Initial Conditions:</b> Steady state operation at 100% power. RHR B is in suppression pool cooling.			
<b>Turnover:</b> APRM 'C' INOP and bypassed due to power supply failure. Heater Drain Pumps, HDL-P1A and C tagged out due to excessive leakage. Main Generator voltage regulator in Manual due to erratic operation in Auto. RCIC slow roll was completed last shift and suppression pool temperatures have been returned to normal. Remove RHR B from suppression pool cooling.			
Event No.	Malf. No.	Event Type *	Event Description
1 T = 0 min.	N/A	N (UO/CRS)	Remove RHR B from suppression pool cooling.
2 T = 10 min.	HPCS004	C (UO/CRS)	Spurious HPCS automatic start and injection. <i>(Tech Specs for CRS)</i>
3 T = 17 min.	NMS015F	I (ALL)	APRM 'F' flow reference signal fails downscale. <i>(Tech Specs for CRS)</i>
4 T = 27 min.	MSS010	C (UO/CRS)	Turbine gland seal pressure regulator valve fails closed.
5 T = 35 min.	P680_2a:e_8	C (ATC/CRS)	Heater Drain Pump HDL-P1D overload.
	N/A	R (ATC)	Lower reactor power with Recirc flow to maintain RPV level
<b>Scram will be automatically initiated on high drywell pressure.</b>			
6 T = 45 min	RCS001	M (ALL)	Rupture of A recirculation loop (Large break LOCA)
	Override	C (ATC/CRS)	Recirc loop A suction isolation valve fails in open position. <i>(After EOP Entry)</i>
7 T = 47 min.	LPCS002	C (UO/CRS)	LPCS injection valve fails to open <i>(After EOP Entry)</i> .

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

<b>Facility:</b> <u>River Bend Station</u>	<b>Scenario No.:</b> <u>3 [BU] (SIS-20.0, IC-164)</u>	<b>Op.-Test No.:</b> <u>1</u>
<b>BANK SCENARIO</b>		
<b>Examiners:</b> _____ _____ _____	<b>Operators:</b> <u>CRS – Control Room Suprv. (SRO)</u> <u>ATC – At-the-Controls (RO)</u> <u>UO – Unit Operator (BOP-RO)</u>	
<b>Initial Conditions:</b> Power ascension to rated in progress, holding at 90% power for Reactor Engineer to check core performance and effects of new rod pattern. RHR B in Suppression Pool Cooling Mode for RCIC slow roll to be done this shift.		
<b>Turnover:</b> APRM 'C' INOP and bypassed due to power supply failure. Heater Drain Pumps, HDL-P1A and C tagged out due to excessive leakage. Main Generator voltage regulator in Manual due to erratic operation in Auto. Complete preparations and slow roll RCIC following lube oil addition.		

Event No.	Mal. No.	Event Type *	Event Description
1 T = 0 min.	N/A	N (UO/CRS)	Place Containment HVAC in High Volume Purge.
2 T = 10 min.	NMS011D CRDM4829	I (ATC/CRS)	APRM 'D' fails upscale with single rod scram. <i>(Tech Specs for CRS)</i>
3 T = 20 min.	RCIC001	C (UO/CRS)	RCIC trip throttle valve fails to open during turbine slow roll. <i>(Tech Specs for CRS)</i>
4 T = 30 min.	OR_P680_3a:d-2 (Alarm Override)	C (ATC/CRS)	Loss of TPCCW to Reactor Feed Pump FWS-P1A Gear Increaser Lube Oil Cooler (requiring P1A shutdown).
	N/A	R (ATC/CRS)	Lower power with Recirc flow as needed for RFP shutdown.

**Scram should be manually initiated before automatic on high reactor pressure with Turbine CVs shutting. RPS failure to scram requires ARI initiation to insert control rods.**

5 T = 40 min	EHC001	M (ALL)	Turbine governor fails low closing Turbine Control Valves
	ED002B		Loss of NPS-SWG1B on transfer from Main Generator to Preferred Transformer.
	RPS001A		RPS fails to scram automatically and manually.
6 T = 41 min.	MSS001		A steam leak in Drywell rises to 500 GPM over 3 minutes. <i>(After EOP Entry).</i>
7 T = 42 min.	HPCS003	C (UO/CRS)	HPCS fails to auto initiate. <i>(After EOP Entry).</i>

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

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**Outline Change Justifications**

**SIMULATOR SCENARIOS**

1. In Scenario 1 (SIS-19) Event 1, replaced shifting Reactor Recirculation Pumps to Fast Speed with raising power with Recirc Flow Control Valves. During validation the pump shift was done twice and took ~30 minutes each time. The replacement evolution, raising power with flow, can be done without ramp restrictions at this power level and can be complete the required reactivity manipulation (>5% change in power) in about 8 minutes.
2. In Scenario 1 (SIS-19), changed the CRD Pump Trip Event 2 to the B pump to make the operating pump in this scenario consistent with the other two scenarios. This had no effect on the UO actions for the trip or the outcome of the scenario.
3. In Scenario 1 (SIS-19), changed Event 3, APRM Flow Reference Failure Downscale to Control Rod Drifting out. During validation, the rod line at which the scenario began was determined to be too high for pump shift. At a more appropriate lower rod line, the APRM Flow Reference Failure no longer resulted in a half scram, which minimized the action for the ATC. The Control Rod Drifting out provides sufficient verifiable actions to evaluate the RO in the ATC position for a required component malfunction.
4. In Scenario 1 (SIS-19), changed Event 7, SLC Pump failure to RCIC Flow Controller failure. During validation, the crew quickly lowered RPV water level as part of EOP-0001A action to prevent flux instability. At the lower rod line established for scenario initial conditions, SRV operation was not enough to raise suppression pool temperature to require SLC injection. With the EOP-0001A, Level/Power Control requirement to lower level to -56 inches, RCIC will auto initiate if the crew does not initiate it earlier. This malfunction will produce the component malfunction actions for the Unit Operator RO instead of the SLC pump failure.
5. During the NRC prep week, it was determined that the scenario originally submitted as Scenario 3 (backup scenario SIS-21) would be better suited for the exam and designated it Scenario 2. Originally submitted Scenario 2 (SIS-20) is now designated Scenario 3 (Backup). References to changes in Scenario 2 below are for originally submitted Scenario 3 and references to changes in Scenario 3 are for originally submitted Scenario 2.
6. In Scenario 2 (SIS-21), changed Event 4 to provide the Unit Operator RO sufficient verifiable actions. The Level transmitter failure provided insufficient action for evaluation.



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### **Outline Change Justifications**

7. In Scenario 2 (SIS-21), moved APRM Flow Reference Failure Downscale from Scenario 1 to this scenario as Event 3. The rod line at 100% results in a half scram from this malfunction. The malfunction involves the UO with backpanel actions and provides more verifiable actions for the ATC than the APRM failure downscale in the original outline submitted.
8. In Scenario 2 (SIS-21), Event 4 in the original outline identified lowering power as a critical task to avoid a low RPV level scram from a low suction pressure trip of one of the operating Reactor Feed Pumps. During validation, it was determined this would not be a critical task. If reactor power was not lowered before securing the Heater Drain Pump, a Recirculation flow control valve runback following the RFP trip maintained level above the low RPV level scram. Added the loss of Turbine Seal Steam malfunction as new Event 4 to provide another component failure for UO RO with verifiable actions and a critical task to recover seal steam to prevent a loss of vacuum Turbine Trip and scram.
9. In Scenario 3 (SIS-20) Event 4, the specific Reactor Feedwater Pump with the TPCCW malfunction was changed to FWS-P1A to set up a loss of all RFPs in Event 5.
10. In Scenario 3 (SIS-20) on the original outline Event 7, the action to address the turbine bypass valve failure was determined to not be a critical task since the leak would reduce pressure rapidly enough to exceed the cooldown rate even if the MSIVs were closed. Replaced the Turbine Bypass Valve malfunction with a failure of the RPS to scram to create a replacement critical task for the ATC to initiate Alternate Rod Insertion (ARI) to insert all control rods.
11. In Scenario 3 (SIS-20) added a loss of NPS SWG1B to Event 5 creating a loss of normal Feedwater to ensure the UO initiation of HPCS is a critical task.
12. In Scenario 3 (SIS-20) changed Turbine failure malfunction to Turbine governor fails low to close Turbine Control Valves slower allowing the operators a more reasonable opportunity to determine that a manual scram is required and to attempt the scram and initiate ARI for critical task completion. With Turbine Speed signal failure the crew during prep week failed to get ARI initiated before it was automatically initiated by high reactor pressure.

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**Outline Change Justifications**

**JOB PERFORMANCE MEASURES**

1. The topic and KAs for Control Room Systems JPM Number 5 were changed to accommodate changing the JPM. The original outline proposed modifying a bank JPM to remove fuses in the Main Control Room backpanels as part of the actions for closing a Stuck Open SRV (River Bend Abnormal Operating Procedure AOP-0035). During validation, it was determined that while modification of the JPM added a step to manipulate a control switch, the JPM actually had only one critical step – remove the second set of fuses. The JPM was replaced with one directly from the bank in the same Safety Function to install jumpers per EOP Enclosure 5 to provide a JPM with a sufficient number of critical steps. As a result the KA statement was changed to match the JPM.
2. The topic and KA for SRO Admin JPM Number 1 was changed because the original JPM concept could not be developed into a sufficiently challenging JPM. The originally proposed JPM topic was replaced with a newly developed JPM titled Determine Alternate Methods of Decay Heat Removal. This task has more safety significance than the originally proposed task and involves the use of a graph and tables.
3. Two of the Control Room Systems JPMs, Number 3 and Number 8 (for ROs only) proposed as being taken directly from the bank, were instead, significantly modified. JPM Number 3 was modified since JPM Number 5 is now being taken directly from the bank as discussed in Item 1 above. The JPM Number 8 was modified to add a critical step.
4. The specific descriptions of some of the JPMs in the Admin and Systems Walkthrough portion of the exam outlines were modified to reflect the titles of newly developed or modified JPMs.

During NRC review of JPMs, Control Room Systems JPM, CRS-08, “Reset Reactor Recirc Flow Control Valve Runback,” was deemed too simple and rejected. Replaced with Backup JPM No. 1, Perform Control Rod Operability Check.

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**Outline Change Justifications**

**WRITTEN EXAM**

The following changes were made to the RO and SRO written exam outlines and, if the change involved a KA rejection, it was included on the ES-401-4, Record of Reject K/As.

1. RO Exam Tier 1/Group 1 KA 295016 AA2.06 had the wrong K/A Topic and Importance Rating. Corrected both in the final outline.

2. RO Exam Tier 2/Group 1 KA 215005, K3.06

Not a feature of River Bend. A loss or malfunction of APRMs or LPRMs does not affect the IRMs.

Randomly selected replacement KA statement, K3.08. Rejected this KA on the basis of it being beyond the scope of RO responsibilities at River Bend to determine the effect that an LPRM failure will have on core thermal calculations. No River Bend RO task supports requiring this knowledge. The RO's responsibility at River Bend is limited to the ability to identify thermal limit values calculated by the Core Monitoring System that require LCO entry. This ability is evaluated in the RO ADMIN - 1 JPM, **RJPM-OPS-ADM-R01**.

Randomly selected replacement KA statement, K3.05.

3. RO Exam Tier 2/Group 1 KA 262002, K1.11

All control room recorders at River Bend are fed from UPS power supplies. Developed exam item QID 951 and submitted with exam materials 7/23/04 for this topic with AOP handout required for exam. Question was rejected as too simple. Determined that within the job scope of RO the KA would not allow a sufficiently discriminating question to be developed.

Randomly selected replacement KA statement, K1.01

4. RO Exam Tier 2/Group 1 KA 300000, K6.11

RO IR is 2.3 (<2.5) with no site-specific priority justification.

Randomly selected replacement KA statement, K6.04 and rejected this KA to avoid double jeopardy with exam item for KA 295019 A1.04. Service Air Refusal valve is one of two auto valves in air systems. In order to develop a sufficiently discriminating question for either KA requires using both automatic valves in the question.

Randomly selected replacement KA statement, K6.12

**River Bend September 2004 RO/SRO License Exam**  
**Outline Change Justifications**

5. RO Exam Tier 3 KA 2.2.22

Question developed for RO exam (QID 926) was determined to be more appropriate as SRO-only and moved to SRO exam Tier 3 to replace NRC rejected SRO-only question (QID 945) for KA 2.2.20.

Randomly selected replacement KA statement, 2.2.12

6. SRO Exam Tier 1/Group 1 KA 295005 AA2.02

Exam item selected (QID 951) and submitted with exam materials 7/23/04 for this topic was rejected as not at SRO level. Based on criteria for SRO-only question, determined that a question on this topic could not be developed that could be tied to any of the 10CFR55.43(b) items.

Randomly selected replacement KA statement, AA2.08

7. SRO Exam Tier 3 KA 2.2.20

Replaced with KA 2.2.22 which was randomly selected for RO exam for which a question was developed that fit the SRO-only criteria. QID 945 for originally selected KA 2.2.20 was rejected by NRC as not SRO-only level. See discussion above for RO Tier 3 KA 2.2.22