ES-401 **BWR Examination Outline** **FORM ES-401-1**

Facility Name: River Bend Station Date of Exam: 12/3/2010

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	A2	G*	Total
1. Emergency & Abnormal Plant Evolutions	1	0	0	0	N/A			0	0	N/A		0	0	4	3	7
	2	0	0	0				0	0			0	0	2	1	3
	Tier Totals	0	0	0				0	0			0	0	6	4	10
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0	0	2	3	5
	2	0	0	0	0	0	0	0	0	0	0	0	0	0 / 1	2	3
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0	3	5	8
3. Generic Knowledge and Abilities Categories		1		2		3		4					0	1 / 2	3 / 4	7
		0		0		0		0						2 / 2	1 / 2	

Note:
1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

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Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)

Q#	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
	295003 Partial or Complete Loss of AC / 6									0
	295004 Partial or Total Loss of DC Pwr / 6									0
76	295005 Main Turbine Generator Trip / 3						04.50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	4	1
	295006 SCRAM / 1									0
	295016 Control Room Abandonment / 7									0
77	295018 Partial or Total Loss of CCW / 8					03		Ability to determine and interpret cause for partial or complete loss as it applies to Partial Loss of CCW.	3.5	1
78	295019 Partial or Total Loss of Inst. Air / 8						04.34	Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	4.1	1
	295021 Loss of Shutdown Cooling / 4									0
79	295023 Refueling Acc / 8						04.45	Ability to prioritize and interpret the significance of each annunciator or alarm.	4.3	1
	295024 High Drywell Pressure / 5									0
80	295025 High Reactor Pressure / 3					03		Ability to determine and interpret suppression pool temperature as it applies to High Reactor Pressure.	4.1	1
	295026 Suppression Pool High Water Temp. / 5									0
	295027 High Containment Temperature / 5									0
81	295028 High Drywell Temperature / 5					02		Ability to determine and interpret reactor pressure as it applies to High Drywell Temperature.	3.9	1
	295030 Low Suppression Pool Wtr Lvl / 5									0
	295031 Reactor Low Water Level / 2									0
82	295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1					06		Ability to determine and interpret reactor pressure as it applies to SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown.	4.1	1
	295038 High Off-site Release Rate / 9									0
	600000 Plant Fire On Site / 8									0
	700000 Generator Voltage and Electric Grid Disturbances / 6									0
	K/A Category Totals:	0	0	0	0	4	3	Group Point Total:		7

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Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)

Q#	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
83	295008 High Reactor Water Level / 2					01		Ability to determine and interpret reactor water level as it applies to High Reactor Water Level.	3.9	1
	295009 Low Reactor Water Level / 2									0
	295010 High Drywell Pressure / 5									0
	295011 High Containment Temp / 5									0
	295012 High Drywell Temperature / 5									0
84	295013 High Suppression Pool Temp. / 5					01		Ability to determine and interpret suppression pool temperature as it applies to High Suppression Pool Temperature.	4	1
	295014 Inadvertent Reactivity Addition / 1									0
	295015 Incomplete SCRAM / 1									0
	295017 High Off-site Release Rate / 9									0
	295020 Inadvertent Cont. Isolation / 5 & 7									0
	295022 Loss of CRD Pumps / 1									0
	295029 High Suppression Pool Wtr Lvl / 5									0
85	295032 High Secondary Containment Area Temperature / 5						04.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	1
	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

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Plant Systems - Tier 2/Group 1 (SRO)

Q#	System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	#
	203000 RHR/LPCI: Injection														0
	205000 Shutdown Cooling Mode														0
	206000 HPCI														0
	207000 Isolation (Emergency) Condenser														0
	209001 LPCS														0
86	209002 HPCS											01.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.4	1
87	211000 SLC											04.21	Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	4.6	1
	212000 RPS														0
88	215003 IRM								02				Ability to (a) predict the impact of an INOP condition on the IRMs and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of that abnormal operation.	3.7	1
	215004 Source Range Monitor														0
	215005 APRM / LPRM														0
89	217000 RCIC								14				Ability to (a) predict the impact of rupture disc failure on RCIC and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of that abnormal operation.	3.4	1
	218000 ADS														0
	223002 PCIS/Nuclear Steam Supply Shutoff														0
	239002 SRVs														0
	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
90	300000 Instrument Air											02.44	Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.4	1
	400000 Component Cooling Water														0
															0
	K/A Category Totals:	0	0	0	0	0	0	0	2	0	0	3	Group Point Total:		5

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Plant Systems - Tier 2/Group 2 (SRO)

Q#	System # / Name	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														0
	202002 Recirculation Flow Control														0
	204000 RWCU														0
	214000 RPIS														0
	215001 Traversing In-core Probe														0
	215002 RBM														0
	216000 Nuclear Boiler Inst.														0
	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
91	239001 Main and Reheat Steam											04.06	Knowledge of EOP mitigation strategies.	4.7	1
	239003 MSIV Leakage Control														0
	241000 Reactor/Turbine Pressure Regulator														0
	245000 Main Turbine Gen. / Aux.														0
	256000 Reactor Condensate														0
92	259001 Reactor Feedwater											04.46	Ability to verify that the alarms are consistent with the plant conditions.	4.2	1
	268000 Radwaste														0
	271000 Offgas														0
	272000 Radiation Monitoring														0
	286000 Fire Protection														0
	288000 Plant Ventilation														0
	290001 Secondary CTMT														0
93	290003 Control Room HVAC								02				Ability to (a) predict the impact of extreme environmental conditions on Control Room HVAC and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of that abnormal operation.	3.4	1
	290002 Reactor Vessel Internals														0
	K/A Category Totals:	0	0	0	0	0	0	0	1	0	0	2	Group Point Total:		3

Facility Name:River Bend Station Date of Exam:12/3/2010

Q#	Category	K/A #	Topic	RO IR	RO #	SRO-Only IR	SRO-Only #
94	1. Conduct of Operations	2.1. 20	Ability to interpret and execute procedure steps.			4.6	1
95		2.1. 34	Knowledge of primary and secondary plant chemistry limits.			3.5	1
		2.1.					
		2.1.					
		2.1.					
		2.1.					
		Subtotal			0		2
96	2. Equipment Control	2.2. 18	Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.			3.9	1
97		2.2. 36	Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.			4.2	1
		2.2.					
		2.2.					
		2.2.					
		2.2.					
		Subtotal			0		2
98	3. Radiation Control	2.3. 04	Knowledge of radiation exposure limits under normal or emergency conditions.			3.7	1
		2.3.					
		2.3.					
		2.3.					
		2.3.					
		2.3.					
		Subtotal			0		1
99	4. Emergency Procedures / Plan	2.4. 35	Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.			4	1
100		2.4. 50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.			4	1
		2.4.					
		2.4.					
		2.4.					
		2.4.					
		Subtotal			0		2
Tier 3 Point Total					0		7

ES-301 **Administrative Topics Outline** **Form ES-301-1**

Facility: River Bend Station Date of Examination: 12/6/2010

Examination Level: RO ☒ SRO ☐ Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R,N	(A1) Determine corrected Fuel Zone Level indication and determine whether or not adequate core cooling exists. KA 2.1.25 IR 3.9
Conduct of Operations	R,D	(A2) Perform Step 113 of STP-000-0001 during Single Loop Operation using provided core monitor print out. KA 2.1.20 IR 4.6
Equipment Control	R,M	(A3) Identify components and sequence for a tagout on HVN-STR1B KA 2.2.13 IR 4.1
Radiation Control	R,M	(A4) Perform a dose assessment and determine acceptability of an RWP. KA 2.3.7 IR 3.5
Emergency Procedures/Plan		

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

ES-301 **Administrative Topics Outline** **Form ES-301-1**

Facility: River Bend Station Date of Examination: 12/6/2010
Examination Level: RO ☐ SRO ☒ Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R,M	(A5) Determine time to 200°F and whether or not a Recirc Pump may be secured. KA 2.1.25 IR 4.2
Conduct of Operations	R,M	(A6) Given a personnel list and their qualification status, determine if minimum staffing requirements are met. KA 2.1.5 IR 3.9
Equipment Control	R,D	(A7) Review a tag out of LOS-STR1. KA 2.2.13 IR 4.3
Radiation Control	R,D	(A8) Review a liquid radwaste release permit issued by Chemistry. KA 2.3.6 IR 3.8
Emergency Procedures/Plan	R,M	(A9) Determine Protective Action Recommendations. KA 2.4.44 IR 4.4

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

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

Facility: River Bend Station — Date of Examination: 12/6/2010
Exam Level: RO ☐ SRO-I ☒ SRO-U ☐ — Operating Test No.: _____

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
(S1) Shift Stator Cooling Water Pumps	A,D,S	4
(S2) Start LPCS in Sup Pool to Sup Pool Lineup w/ pump trip	A,D,S,EN	2
(S3) Start Drywell Low Vol purge to vent the drywell	A,EN,N,L	9
(S4) Shift CRD Pumps with trip of on-coming pump	A,M,S	1
(S5) Restore Offsite power with AOP-0004	D,L,S	6
(S6) Perform Rod Withdrawal Limiter Surveillance (> HPSP)	N,S	7
(C1) Defeat RWCU Level 2 and SLC Initiation Isolation Interlocks	C,D,EN,L	5

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

(P1) Inject into the RPV with Fire Water.	E,L,M,R	8
(P2) Startup RPS MG Set B with failure to achieve voltage	A,M	7
(P3) Place RHR in Sup Pool Cooling mode from Div 2 RSS	D,E,L	5

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

NRC

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

Facility: River Bend Station — Date of Examination: 12/6/2010

Exam Level: RO ☒ SRO-I ☐ SRO-U ☐ — Operating Test No.: _____

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
(S1) Shift Stator Cooling Water Pumps	A,D,S	4
(S2) Start LPCS in Sup Pool to Sup Pool Lineup w/ pump trip	A,D,S,EN	2
(S3) Start Drywell Low Vol purge to vent the drywell	A,EN,N,L	9
(S4) Shift CRD Pumps with trip of on-coming pump	A,M,S	1
(S5) Restore Offsite power with AOP-0004	D,L,S	6
(S6) Perform Rod Withdrawal Limiter Surveillance (> HPSP)	N,S	7
(C1) Defeat RWCU Level 2 and SLC Initiation Isolation Interlocks	C,D,EN,L	5
(C2) Stuck open SRV fuse removal per AOP-0035	C,D	3
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
(P1) Inject into the RPV with Fire Water.	E,L,M,R	8
(P2) Startup RPS MG Set B with failure to achieve voltage	A,M	7
(P3) Place RHR in Sup Pool Cooling mode from Div 2 RSS	D,E,L	5

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

NRC

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

Facility: River Bend Station — Date of Examination: 12/6/2010

Exam Level: RO ☐ SRO-I ☐ SRO-U ☒ — Operating Test No.: _____

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
(S1) Shift Stator Cooling Water Pumps	A,D,S	4
(S2) Start LPCS in Sup Pool to Sup Pool Lineup w/ pump trip	A,D,S,EN	2
(C1) Defeat RWCU Level 2 and SLC Initiation Isolation Interlocks	C,D,EN,L	5

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

(P1) Inject into the RPV with Fire Water.	E,L,M,R	8
(P2) Startup RPS MG Set B with failure to achieve voltage	A,M	7

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Facility: River Bend Station Date of Exam: 12/3/2010 Operating Test No. Team:

APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I ☒ I4, I2, I6 SRO-U ☐	RX								2					1	1	1	0
	NOR	1					1							2	1	1	1
	I/C	3,4,5,6, 8,9					5,7							8	4	4	2
	MAJ	7					6		6					3	2	2	1
	TS	3,4												2	0	2	2
RO ☐ SRO-I ☒ I5,I3,I7 SRO-U ☐	RX		2											1	1	1	0
	NOR				1			1						2	1	1	1
	I/C		6,8,9		3,4,5,7, 8			3,4,5,7, 8						13	4	4	2
	MAJ		7		6			6						3	2	2	1
	TS				3,4			3,4						4	0	2	2
RO ☒ R5,R4,R6 SRO-I ☐ SRO-U ☐	RX					2								1	1	1	0
	NOR			1						1				2	1	1	1
	I/C			3,4,5		8				3,5,7,8				8	4	4	2
	MAJ			7		6				6				3	2	2	1
	TS													0	0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility: River Bend Station Date of Exam: 12/3/2010 Operating Test No. Team:

APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I ☐ SRO-U ☒ U2	RX													0	1	1	0
	NOR	1			1									2	1	1	1
	I/C	3,4,5,6,8,9			3,4,5,7,8									11	4	4	2
	MAJ	7			6									2	2	2	1
	TS	3,4			3,4									4	0	2	2
RO ☒ R2 SRO-I ☐ SRO-U ☐	RX		2											1	1	1	0
	NOR						1							1	1	1	1
	I/C		6,8,9				5,7							5	4	4	2
	MAJ		7				6							2	2	2	1
	TS													0	0	2	2
RO ☒ R3 SRO-I ☐ SRO-U ☐	RX					2								1	1	1	0
	NOR			1										1	1	1	1
	I/C			3,4,5		8								4	4	4	2
	MAJ			7		6								2	2	2	1
	TS													0	0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

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

Facility: River Bend Station Scenario No.: 1 Op-Test No.:

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: Preparing for downpower for sequence exchange.
_____
_____

Turnover: Complete breaker functional per SOP on the HPCS breaker.
_____
_____

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP,SRO)	Perform HPCS Pump Breaker Functional per SOP.
2		R(ATC)	Lower reactor power with control rods.
3	RCIC009	I (BOP,SRO)	Spurious RCIC Isolation. (Technical Specifications)
4	B21005	I (BOP,SRO)	B21-PTN078A RPV pressure transmitter fails high. (Technical Specifications)
5	GMC002A GMC00001B	C (BOP,SRO)	Stator Cooling Pump A trips, Stby pump fails to AUTO start requiring manual start.
6	GMC002B	C (ATC,SRO)	Second Stator Cooling Pump trips / Reactor Scram
7	RPS001A	M (ALL)	RPS Fails to Scram – All Signals
8	FWS004A	C (ATC,SRO)	FWS Master Controller output fails low
9	EHC002A	C (ATC,SRO)	Main Turbine Bypass Valves fail OPEN.

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

Total Malfunctions: (5-8): (7) RCIC, B21-PTN078A, Stator Cooling Pumps A & B, ATWS, FWS Controller, BPVs
Malfunctions after EOP entry: (1-2) (2) FWS, BPVs
Abnormal events: (2-4): (2) (AOP-3, AOP-1)
Major transients: (1-2): (1) ATWS
EOPs entered: (1-2): (2)EOP-1, EOP-2
EOP contingencies: (0-2) (1) EOP-1A
Critical tasks: (2-3) (2) Terminate FW injection, Begin control insertion.

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

Facility: River Bend Station Scenario No.: 2 Op-Test No.:

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: Mode 1 74% power.
_____
_____

Turnover: Perform STP-406-0201
_____
_____

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP,SRO)	Perform STP-406-0201.
2		R (ATC)	Raise reactor power with reactor recirculation flow.
3	ED004K	C (SRO)	Loss of NJS-LDC1K (Technical Specification).
4	RMS013A	C (SRO)	RMS-RE13A fails upscale.(Technical Specification)
5		C (BOP,SRO)	HVC-AOD51A fails to isolate, but can be manually isolated.
6	WCS006	M (ALL)	RWCU leak in the Main Steam Tunnel
7	WCS005	C(BOP,SRO)	G33-MOVF001 fails to automatically isolate.
8	TMS007	C(ATC,SRO)	Main Turbine fails to Auto trip.

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

Total Malfunctions: (5-8) (6) NJS-LDC1K, RMS-RE13A, HVC-AOD108, RWCU leak, G33-MOVF001, Main Turbine
Malfunctions after EOP entry: (1-2) (2) G33-MOVF001, Main Turbine
Abnormal events: (2-4) (3) AOP-3, AOP-1, AOP-2
Major transients: (1-2) (1) Steam Tunnel leak
EOPs entered: (1-2) (2) EOP-1, EOP-3
EOP contingencies: (0-2) (0)
Critical tasks: (2-3) (2) Isolate leak, Trip the main turbine

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

Facility: River Bend Station Scenario No.: 3 Op-Test No.:

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: Mode 1, 100%, RCIC tagged out
_____
_____

Turnover: Lower power to 85% to support control rod sequence exchange.
_____
_____

Event No.	Malf. No.	Event Type*	Event Description
1		N (SRO,BOP)	Perform STP-256-0202.
2		R(ATC)	Lower reactor power to 85% with reactor recirculation flow.
3		C (SRO,BOP)	HVR-UC1A trips. (Technical Specifications)
4	B21006B	I (SRO)	Level transmitter B21-LTN081A fails downscale (Technical Specifications).
5	CCP001B CCP004A	C (SRO,BOP)	CCP Pump B trips, CCP Pump A fails to Auto start
6	ED001 EDG001A EDG002B	M(ALL)	Station Blackout • Loss of offsite power • Div 1 DG trips • Div 2 DG fails to start
7	SWP004	C (SRO,BOP)	SWP-AOV599 fails to auto open.
8	HPCS003	C (SRO,BOP)	HPCS fails to automatically initiate *(Pump only, DG starts on LOP to required SWP-AOV599 actions).*

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

Total Malfunctions: (5-8) (6) HVR UC, LTN081A, CCP, SBO, SWP-AOV599, HPCS
Malfunctions after EOP entry: (1-2) (2) SWP-AOV599, HPCS
Abnormal events: (2-4) (2) AOP-1, AOP-50
Major transients: (1-2) (1) SBO
EOPs entered: (1-2) (2) EOP-1, EOP-2
EOP contingencies: (0-2) (1) Alternate Level Control
Critical tasks: (2-3) (2) Open SWP-AOV599, Maintain Adequate Core Cooling with HPCS

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

Facility: River Bend Station Scenario No.: 4 Op-Test No.:

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: Mode 1, 50% power. Plant startup in progress. GOP-0001 Step G.29. (2 FWS pumps in service. HPCS tagged out.)

Turnover: Start HDL pumps A & C. Then raise power to 55% per reactivity control plan Step XX. Hold at 55% until chemistry is adequate to Pump Forward. Start RHR in Sup Pool Cooling lineup to support system flush.

Event No.	Malf. No.	Event Type*	Event Description
1		N (SRO,BOP)	Start HDL Pumps A & C in Recirc mode.
2		R(ATC)	Raise power to 55% with control rods.
3		N (SRO,BOP)	Start RHR A in Suppression Pool Cooling mode per SOP-0031 to support system flush to reduce dose rates in pump room.
4	RHR002A	C (SRO,BOP)	RHR A trips. (Technical Specifications)
5		C (SRO)	CMS H2 analyzer failure (Technical Specifications)
6	CNM006 FWS010 RPS001B	M (ALL)	Condensate filter high differential pressure. Total loss of feedwater. Reactor Scram. ARI inserts rods.
7	RCIC001	C (SRO,BOP)	RCIC turbine trips, but can be manually reset for level control.
8	MSS111P MSS112P	C (SRO,BOP)	MSS-MOV111/112 fail to isolate causing uncontrolled pressure drop.

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

Total Malfunctions: (5-8) (6) RHR A, CMS, CNM dp, RPS, RCIC, MSS
Malfunctions after EOP entry: (1-2) (2) RCIC, MSS
Abnormal events: (2-4) (2) AOP-1, AOP-2
Major transients: (1-2) (1) Loss of FW
EOPs entered: (1-2) (2) EOP-1, EOP-2
EOP contingencies: (0-2) (1) Alternate level control
Critical tasks: (2-3) (2) Adequate core cooling with RCIC, Close MSIVs or MSS to avoid exceeding cooldown rate.

ES-401 **Record of Rejected K/As** **Form ES-401-4**

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	295005 AA1.06	Importance rating for this KA is <2.5 and there is no site-specific priority associated with this KA. Re-selected 295005 AA1.05
1/1	600000 AA1.07	Importance rating for this KA is <2.5 and there is no site-specific priority associated with this KA. Re-selected 600000 AA1.05
2/1	223002 A3.04	Importance rating for this KA is <2.5 and there is no site-specific priority associated with this KA. Re-selected 223002 A3.01
2/1	300000 K6.11	Importance rating for this KA is <2.5 and there is no site-specific priority associated with this KA. Re-selected 300000 K6.13
2/2	239003 A3.05	Importance rating for this KA is <2.5 and there is no site-specific priority associated with this KA. Re-selected 239003 A3.02
1/1	295023 AA2.05	Inability to write a discriminatory RO level question for this KA. Re-selected 295023 AA2.02
1/2	295002 G.2.2.36	There is no associated limiting condition for operation for this abnormal event. Re-selected 295002 G.2.1.32.
2/1	261000 G.2.4.50	Inability to write a discriminatory RO level question for this KA. Re-selected 261000 G.2.2.22.

ES-401 **Record of Rejected K/As** **Form ES-401-4**

Tier / Group	Randomly Selected K/A	Reason for Rejection
2/1	217000 A2.06	Importance rating for this KA is <2.5 and there is no site-specific priority associated with this KA. Re-selected 217000 A2.14
2/1	209002 G.2.4.47	Inability to write a discriminatory SRO level question for this KA. Re-selected 209002 G.2.1.32
2/1	300000 G.2.2.39	No credible tie exists for this system and this Generic KA. Re-selected 300000 G.2.2.44.
2/2	239001 G.2.2.42	No credible tie exists for this system and this Generic KA. Re-selected 239001 G.2.4.6