

Draft Submittal

**BRUNSWICK OCT/NOV 2004**

**EXAM 50-325, 324/2004-301  
OCTOBER 29, 2004 &  
NOVEMBER 2 - 10, 2004**

Written Exam Sample outlines

-Facility: Brunswick		Date of Exam: 10/29/04																	
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	3	3	3				4	4				3	20	0	0	4	4	8
	2	1	1	1				1	2				1	7	0	0	3	1	4
	Tier Totals	4	4	4				5	6				4	27	0	0	7	5	12
2. Plant Systems	1	3	3	2	3	1	3	2	2	2	3	2	26	0	0	0	4	4	
	2	1	1	1	1	1	1	1	1	2	1	1	12	0	0	2	0	2	
	Tier Totals	4	4	3	4	2	4	3	3	4	4	3	38	0	0	2	4	6	
3. Generic Knowledge and Abilities Categories																			
				1	2	3	4												
				2	2	3	3												

- Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO outline (i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding SRO sampling.
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.





System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	#											
203000 RHR/LPCI: Injection Mode				x					X			K4.13 Design features for leak to environment A3.04 Monitor flow with AUTO LPCI	3.4 3.8	2											
205000 Shutdown Cooling		X										K2.02 Power supply to MOVs	2.5	1											
206000 HPCI						x				X		A4.05 Operate HPCI and monitor water level K6.02 Effect of loss of DC power on HPCI ops	4.4 3.3	2											
207000 Isolation (Emergency) Condenser												NOT Applicable to BNP	NA	0											
209001 LPCS										X		A4.13 Monitor lights and alarms	3.4	1											
209002 HPCS												NOT Applicable to BNP	NA	0											
211000 SLC										X		A4.03 Operate and monitor Squib valve status	4.1	1											
212000 RPS											X	2.22 Knowledge of LCO and SL	3.4	1											
215003 IRM							x					A1.05 Monitor & predict SCRAM & Rod Block	3.9	1											
215004 Source Range Monitor										x		A3.02 Monitor ann. And alarm signals	3.4	1											
215005 APRM / LPRM		X			x							K2.02 APRM channel power supplies K5.04 LPRM location core symmetry	2.6 2.9	2											
217000 RCIC			x									K3.04 Loss of RCIC and Adequate Core Cool	3.6	1											
218000 ADS				X								K4.01 Design to prevent ADS initiation	3.7	1											
223002 PCIS/Nuclear Steam Supply Shutoff							X					A1.01 Monitor PCIS lights and indications	3.5	1											
239002 SRVs		X										K2.01 Power to SRV solenoids	2.8	1											
259002 Reactor Water Level Control								X				A2.06 Predict impact loss of controller signal	3.3	1											
261000 SGTS				X								K4.03 Design allowing for moisture removal	2.5	1											
262001 AC Electrical Distribution	X											K1.02 Cause/effect DC and AC power	3.3	1											
262002 UPS (AC/DC)			x								X	2.2.25 TS bases K3.15 Effect of loss of UPS on main turbine	2.5 2.6	2											
263000 DC Electrical Distribution							X					K6.01 Effect of loss of Ac on DC distribution	3.2	1											
264000 EDGs	X					X						K1.06 cause/effect starting system K6.01 Effect of loss of starting air	3.2 3.8	2											
300000 Instrument Air								X				A2.01 Dryer malfunction effect on IA	2.9	1											
400000 Component Cooling Water	X											K1.04 Determine source of leakage into CCW	2.9	1											
K/A Category Point Totals:													3	3	2	3	1	3	2	2	2	3	2	Group Point Total:	26

ES-401BWR Examination Outline Form ES-401-1  
 Plant Systems - Tier 2/Group 2 (RO)

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	#
201001 CRD Hydraulic												Not selected	N/A	0
201002 RMCS												Not selected	N/A	0
201003 Control Rod and Drive Mechanism											X	A4.02 Monitor CRDM position	3.5	1
201004 RSCS												NOT Applicable to BNP	N/A	0
201005 RCIS												NOT Applicable to BNP	N/A	0
201006 RWM									X			A3.03 Monitor RWM alarms and ann.	3.1	1
202001 Recirculation												Not selected	N/A	0
202002 Recirculation Flow Control											X	2.1.2 Operator responsibilities	3.0	1
204000 RWCU							X					A1.09 Monitor vessel conductivity	3.0	1
214000 RPIS												Not selected	N/A	0
215001 Traversing In-core Probe								X				A2.02 effect of high drywell pressure	2.9	1
215002 RBM												Not selected	N/A	0
216000 Nuclear Boiler Inst.												Not selected	N/A	0
219000 RHR/LPCI: Torus/Pool Cooling Mode												Not selected	N/A	0
223001 Primary CTMT and Aux.				X								K4.06 design to maintain PC/SC D/P	3.1	1
226001 RHR/LPCI: CTMT Spray Mode												Not selected	N/A	0
230000 RHR/LPCI: Torus/Pool Spray Mode												Not selected	N/A	0
233000 Fuel Pool Cooling/Cleanup												Not selected	N/A	0
234000 Fuel Handling Equipment									X			A3.02 Refueling interlock operation	3.1	1
239001 Main and Reheat Steam												Not selected	N/A	0
239003 MSIV Leakage Control												NOT Applicable to BNP	N/A	0
241000 Reactor/Turbine Pressure Regulator												Not selected	N/A	0
245000 Main Turbine Gen. / Aux.			X									K3.02 Effect of turb. trip on reactor press.	3.9	1
256000 Reactor Condensate		X										K2.01 power supply to system pumps	2.7	1
259001 Reactor Feedwater	X											K1.04 Interrelationship with extract. Strm.	2.8	1
268000 Radwaste												Not selected	N/A	0
271000 Offgas												Not selected	N/A	0
272000 Radiation Monitoring												Not selected	N/A	0
286000 Fire Protection												Not selected	N/A	0
288000 Plant Ventilation					X							K5.02 ventilation and D/P	3.2	1
290001 Secondary CTMT												Not selected	N/A	0
290003 Control Room HVAC						X						K6.01 Effect of loss of power on HVAC	2.7	1
290002 Reactor Vessel Internals												Not selected	N/A	0
K/A Category Point Totals:	1	1	1	1	1	1	1	1	1	2	1	Group Point Total:		12







System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	#
203000 RHR/LPCI: Injection Mode											x	2.4.30 Reportability	3.6	1
205000 Shutdown Cooling												Not selected	N/A	0
206000 HPCI												Not selected	N/A	0
207000 Isolation (Emergency) Condenser												NOT Applicable to BNP	N/A	0
209001 LPCS											x	2.1.33 Entry level tech specs.	4.0	1
209002 HPCS												NOT Applicable to BNP	N/A	0
211000 SLC												Not selected	N/A	0
212000 RPS												Not selected	N/A	0
215003 IRM												Not selected	N/A	0
215004 Source Range Monitor												Not selected	N/A	0
215005 APRM / LPRM												Not selected	N/A	0
217000 RCIC												Not selected	N/A	0
218000 ADS												Not selected	N/A	0
223002 PCIS/Nuclear Steam Supply Shutoff												Not selected	N/A	0
239002 SRVs												Not selected	N/A	0
259002 Reactor Water Level Control												Not selected	N/A	0
261000 SGTS												Not selected	N/A	0
262001 AC Electrical Distribution											x	2.2.25 Knowledge of TS Bases	3.7	1
262002 UPS (AC/DC)												Not selected	N/A	0
263000 DC Electrical Distribution												Not selected	N/A	0
264000 EDGs											x	2.4.22 Knowledge of prioritization	4.0	1
300000 Instrument Air												Not selected	N/A	0
400000 Component Cooling Water												Not selected	N/A	0
K/A Category Point Totals:	0	0	0	0	0	0	0	0	0	0	0	4	Group Point Total:	4

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 Plant Systems - Tier 2/Group 2 (SRO)

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	#
201001 CRD Hydraulic												Not selected	N/A	0
201002 RMCS												Not selected	N/A	0
201003 Control Rod and Drive Mechanism												Not selected	N/A	0
201004 RSCS												NOT Applicable to BNP	N/A	0
201005 RCIS												NOT Applicable to BNP	N/A	0
201006 RWM												Not selected	N/A	0
202001 Recirculation												Not selected	N/A	0
202002 Recirculation Flow Control												Not selected	N/A	0
204000 RWCU												Not selected	N/A	0
214000 RPIS												Not selected	N/A	0
215001 Traversing In-core Probe												Not selected	N/A	0
215002 RBM								x				A2.05 Predict impact RBM High or INOP	3.3	1
216000 Nuclear Boiler Inst.												Not selected	N/A	0
219000 RHR/LPCI: Torus/Pool Cooling Mode								X				A2.05 Predict impact of electrical failures	3.5	1
223001 Primary CTMT and Aux.												Not selected	N/A	0
226001 RHR/LPCI: CTMT Spray Mode												Not selected	N/A	0
230000 RHR/LPCI: Torus/Pool Spray Mode												Not selected	N/A	0
233000 Fuel Pool Cooling/Cleanup												Not selected	N/A	0
234000 Fuel Handling Equipment												Not selected	N/A	0
239001 Main and Reheat Steam												Not selected	N/A	0
239003 MSIV Leakage Control												NOT Applicable to BNP	N/A	0
241000 Reactor/Turbine Pressure Regulator												Not selected	N/A	0
245000 Main Turbine Gen. / Aux.												Not selected	N/A	0
256000 Reactor Condensate												Not selected	N/A	0
259001 Reactor Feedwater												Not selected	N/A	0
288000 Radwaste												Not selected	N/A	0
271000 Offgas												Not selected	N/A	0
272000 Radiation Monitoring												Not selected	N/A	0
286000 Fire Protection												Not selected	N/A	0
288000 Plant Ventilation												Not selected	N/A	0
290001 Secondary CTMT												Not selected	N/A	0
290003 Control Room HVAC												Not selected	N/A	0
290002 Reactor Vessel Internals												Not selected	N/A	0
K/A Category Point Totals:	0	0	0	0	0	0	0	2	0	0	0	Group Point Total:		2







ES-401 Generic Knowledge and Abilities Outline (Tier 3) Form ES-401-3

Facility: Brunswick

Date of Exam: 10/29/04

Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.23	Ability to perform specific system and Integrated plant procedures	3.9	1		
	2.1.3	Knowledge of shift turnover practices.	3.0	1		
	2.1.11	Knowledge of less than one hour technical specification action statements for systems.			3.8	1
	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics			4.4	1
	Subtotal			2		2
2. Equipment Control	2.2.30	Knowledge of RO duties in the control room during fuel handling	3.5	1		
	2.2.4	(multi-unit) Ability to explain the variations in control board layouts	2.8	1		
	2.2.17	Knowledge of the process for managing maintenance activities during power operations.			3.5	1
	Subtotal			2		1
3. Radiation Control	2.3.2	Knowledge of facility ALARA program.	2.5	1		
	2.3.4	Knowledge of radiation exposure limits and contamination control	2.5	1		
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation	2.9	1		
	2.3.3	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room			2.9	1
	2.3.9	Knowledge of the process for performing a containment purge.			3.4	1
	Subtotal			3		2
4. Emergency Procedures / Plan	2.4.34	Knowledge of RO tasks performed outside the main control room during emergency operations.	3.8	1		
	2.4.15	Knowledge of communications procedures associated with EOP implementation.	3.0	1		
	2.4.13	Knowledge of crew roles and responsibilities during EOP flowchart use.	3.3	1		
	2.4.28	Knowledge of procedures relating to emergency response to sabotage.			3.3	1
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions			4.3	1
	Subtotal			3		2
Tier 3 Point Total				10		7

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Facility: Brunswick

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Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.23	Ability to perform specific system and integrated plant procedures	3.9	1		
	2.1.3	Knowledge of shift turnover practices.	3.0	1		
	2.1.11	Knowledge of less than one hour technical specification action statements for systems.			3.8	1
	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics			4.4	1
	Subtotal			2		2
2. Equipment Control	2.2.30	Knowledge of RO duties in the control room during fuel handling	3.5	1		
	2.2.4	(multi-unit) Ability to explain the variations in control board layouts	2.8	1		
	2.2.17	Knowledge of the process for managing maintenance activities during power operations.			3.5	1
	Subtotal			2		1
3. Radiation Control	2.3.2	Knowledge of facility ALARA program.	2.5	1		
	2.3.4	Knowledge of radiation exposure limits and contamination control	2.5	1		
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation	2.9	1		
	2.3.3	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room			2.9	1
	2.3.9	Knowledge of the process for performing a containment purge.			3.4	1
	Subtotal			3		2
4. Emergency Procedures / Plan	2.4.34	Knowledge of RO tasks performed outside the main control room during emergency operations.	3.8	1		
	2.4.15	Knowledge of communications procedures associated with EOP implementation.	3.0	1		
	2.4.13	Knowledge of crew roles and responsibilities during EOP flowchart use.	3.3	1		
	2.4.28	Knowledge of procedures relating to emergency response to sabotage.			3.3	1
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions			4.3	1
	Subtotal			3		2
Tier 3 Point Total				10		7