

Facility: Monticello Nuclear Generating Plant													Date of Exam: 06-12-2015					
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	4	4	3	N/A			3	3	N/A			3	20	3	4	7	
	2	1	1	1	N/A			2	1	N/A			1	7	1	2	3	
	Tier Totals	5	5	4	N/A			5	4	N/A			4	27	4	6	10	
2. Plant Systems	1	2	1	2	3	3	3	2	3	2	2	3	26	2	3	5		
	2	1	1	1	1	0	2	1	1	2	1	1	12	0	1	3		
	Tier Totals	3	2	3	4	3	5	3	4	4	3	4	38	3	5	8		
3. Generic Knowledge and Abilities Categories				1		2		3		4		10		1	2	3	4	7
				3		3		2		2				2	2	1	2	
<p>Note:</p> <ol style="list-style-type: none"> <li>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).</li> <li>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.</li> <li>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/evolutions 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.</li> <li>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.</li> <li>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.</li> <li>Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.</li> <li>* 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.</li> <li>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.</li> <li>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.</li> </ol>																		

ES-401		BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1						Form ES-401-1	
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	R						AK1.02 Power/flow distribution	3.3	1
295003 Partial or Complete Loss of AC / 6		R				S	AK2.03 AC electrical distribution system AA2.05 Whether a partial or complete loss of AC power has occurred.	3.7 4.2	2 76
295004 Partial or Total Loss of DC Pwr / 6			R				AK3.01 Load shedding	2.6	3
295005 Main Turbine Generator Trip / 3				R			AA1.07 A.C. electrical distribution	3.3	4
295006 SCRAM / 1					R	S	AA2.03 Reactor water level 2.4.21: 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	4.0 4.6	5 77
295016 Control Room Abandonment / 7					S	R	2.4.34 Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational affect. AA2.04: Suppression pool temperature	4.2 4.1	6 78
295018 Partial or Total Loss of CCW / 8	R						AK1.01 Effects on component/system operations	3.5	7
295019 Partial or Total Loss of Inst. Air / 8		R					AK2.12 SBT	3.3	8
295021 Loss of Shutdown Cooling / 4			R				AK3.01 Raising reactor water level	3.3	9
295023 Refueling Acc / 8				R			AA1.02 FPC&C	2.9	10
295024 High Drywell Pressure / 5					R		EA2.01 Drywell pressure	4.2	11
295025 High Reactor Pressure / 3						R	2.2.37 Ability to determine operability and/or availability of safety related equipment.	3.7	12
295026 Suppression Pool High Water Temp. / 5	R						EK1.01 Pump NPSH	3.0	13
295027 High Containment Temperature / 5							N/A MNGP		
295028 High Drywell Temperature / 5		R					EK2.04 Drywell ventilation	3.6	14
295030 Low Suppression Pool Wtr Lvl / 5	R					S	EK1.03 Heat capacity 2.4.2: Knowledge of system setpoints, interlocks and automatic actions associated with EOP entry conditions.	3.8 4.6	15 79

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BWR Examination Outline  
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

Form ES-401-1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295031 Reactor Low Water Level / 2		R				S	EK2.10 Redundant reactivity control 2.1.20: Ability to interpret and execute procedure steps.	4. 0 4. 6	16 80
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1			R				EK3.07 Various alternate methods of control rod insertion	4. 2	17
295038 High Off-site Release Rate / 9				R			EA1.04 SPDS	2. 8	18
600000 Plant Fire On Site / 8					R S		AA2.06 Need for pressurizing control room (Recirc Mode) AA2.15 (SRO): Requirements for establishing a fire watch	2. 5 3. 5	19 81
700000 Generator Voltage and Electric Grid Disturbances / 6						R S	2.1.25 Ability to interpret reference materials, such as graphs, curves, tables etc. 2.2.44 (SRO): 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.	3. 9	20 82
K/A Category Totals:	4	4	3	3	3 3	3 4	Group Point Total:		20 7

ES-401										BWR Examination Outline		Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2													
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						S	AA2.02: Reactor power			3. 3	83		
295007 High Reactor Pressure / 3													
295008 High Reactor Water Level / 2													
295009 Low Reactor Water Level / 2	R					S	AK1.03 Jet pump NPSH 2.2.12: Knowledge of surveillance procedures			2. 7  4. 1	21   84		
295010 High Drywell Pressure / 5													
295011 High Containment Temp / 5							N/A MNGP						
295012 High Drywell Temperature / 5													
295013 High Suppression Pool Temp. / 5		R					AK2.01 Suppression pool cooling			3. 6	22		
295014 Inadvertent Reactivity Addition / 1						S	2.1.32: Ability to explain and apply system limits and precautions			4. 0	85		
295015 Incomplete SCRAM / 1													
295017 High Off-site Release Rate / 9			R				AK3.04 Power reduction			3. 6	23		
295020 Inadvertent Cont. Isolation / 5 & 7				R			AA1.01 PCIS			3. 6	24		
295022 Loss of CRD Pumps / 1				R			AA1.01 CRD Hydraulic System			3. 1	25		
295029 High Suppression Pool Wtr Lvl / 5													
295032 High Secondary Containment Area Temperature / 5					R		EA2.01 Area temperature			3. 8	26		
295033 High Secondary Containment Area Radiation Levels / 9						R	2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.			4. 1	27		
295034 Secondary Containment Ventilation High Radiation / 9													
295035 Secondary Containment High Differential Pressure / 5													
295036 Secondary Containment High Sump/Area Water Level / 5													
500000 High CTMT Hydrogen Conc. / 5													
K/A Category Point Totals:	1	1	1	2	1	1	Group Point Total:			7	3		
					1	2							

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 1											Form ES-401-1		
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	#
203000 RHR/LPCI: Injection Mode									R			A3.04 System flow	3.8	28
205000 Shutdown Cooling										R		A4.10 System pressures	2.9	29
206000 HPCI											R	2.4.9 Knowledge of low power/shutdown implications in accident mitigation strategies.	3.8	30
207000 Isolation Condenser												N/A MNGP		
209001 LPCS	R											K1.01 Condensate storage tank 2.1.23: Ability to perform specific system and integrated plant procedures during all modes of plant operations.	3.1 4.4	31 86
209002 HPCS												N/A MNGP		
211000 SLC			R	R								K3.01 Ability to shutdown the reactor K4.10 Overpressure protection	2.6 2.8	32 33
212000 RPS				R	R							K4.04 Prevention of supplying both RPS buses simultaneously from the alternate power source K5.02 Specific logic arrangements 2.4.6: Knowledge of EOP mitigations strategies.	3.1 3.3 4.7	34 35 87
215003 IRM					R	R						K5.01 Detector operation K6.06 APRM	2.6 3.2	36 37
215004 Source Range Monitor						R	R					K6.02 24/48 volt D.C. power A1.06 Lights and alarms	3.1 3.1	38 39
215005 APRM / LPRM							R	R	S			A1.01 Reactor power indication A2.04 Scram trip signals A2.08 (SRO): Faulty or erratic operation of detectors/systems.	4.0 3.8 3.4	40 41 88
217000 RCIC								R				A2.12 Valve openings	3.0	42
218000 ADS									R			A3.01 ADS valve operation	4.2	43
223002 PCIS										R		A4.01 Valve closures	3.6	44

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BWR Examination Outline  
Plant Systems - Tier 2/Group 1

Form ES-401-1

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	#
239002 SRVs											R	2.2.25 Knowledge of the bases in technical specifications for limiting conditions for operations and safety limits.	3. 2	45
259002 Reactor Water Level Control	R											K1.02 Main steam flow	3. 2	46
261000 SGTS											R	2.1.27 Knowledge of system purpose and/or function.	3. 9	47
											S	2.2.40 (SRO): Ability to apply technical specifications for a system.	4. 7	89
262001 AC Electrical Distribution			R									K3.03 DC electrical distribution	2. 9	48
262002 UPS (AC/DC)				R								K4.01 Transfer from preferred power to alternate power supplies	3. 1	49
263000 DC Electrical Distribution					R							K5.01 Hydrogen generation during battery charging	2. 6	50
264000 EDGs						R		S				K6.07 Cooling water system	3. 8	51
												A2.09: Loss of A.C. Power	4. 1	90
300000 Instrument Air		R										K2.01 Instrument air compressor	2. 8	52
400000 Component Cooling Water								R				A2.03 High/low CCW temperature	2. 9	53
K/A Category Point Totals:	2	1	2	3	3	3	2	3	2	2	3	Group Point Total:		26
								2			3			5

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 2											Form ES-401-1			
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	#	
201001 CRD Hydraulic															
201002 RMCS						R						K6.01 Select matrix power	2.5	54	
201003 CRDM							R					A1.03 CRD drive water flow	2.9	55	
201006 RWM											S	2.2.38: Knowledge of conditions and limitations in the facility license.	4.5	91	
202001 Recirculation								R			S	A2.11 Low reactor water level	3.7	56	
												2.4.47: Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	92	
202002 Recirculation Flow Control									R			A3.03 Scoop tube operation	3.1	57	
204000 RWCU															
214000 RPIS															
215001 Traversing In-core Probe									R			A3.03 Valve operation	2.5	58	
215002 RBM										R		A4.03 Trip bypasses	2.8	59	
216000 Nuclear Boiler Inst.	R											K1.12 Reactor water level control system	3.6	60	
219000 RHR/LPCI: Torus Cooling Mode															
223001 Primary CTMT and Aux.											R	2.1.32 Ability to explain and apply system limits and precautions	3.8	61	
226001 RHR/LPCI: CTMT Spray Mode															
230000 RHR/LPCI: Torus Spray Mode															
233000 Fuel Pool Cooling/Cleanup															
234000 Fuel Handling Equipment															
239001 Main and Reheat Steam		R										K2.01 MSIVs solenoids	3.2	62	
239003 MSIV Leakage Control															
241000 Reactor Pressure Regulator															
245000 Main Turbine Gen. / Aux.															
256000 Reactor Condensate															
259001 Reactor Feedwater															
268000 Radwaste			R									K3.04 Drain sumps	2.7	63	
271000 Offgas				R				S				K4.08 Automatic system isolation	3.1	64	
												A2.04 Offgas system high radiation	4.1	93	
272000 Radiation Monitoring						R						K6.03 A.C. Power	2.8	65	
286000 Fire Protection															
288000 Plant Ventilation															
290001 Secondary CTMT															
290003 Control Room HVAC															
290002 Reactor Vessel Internals															
K/A Category Point Totals:	1	1	1	1	0	2	1	1	2	1	1	Group Point Total:		12	
								1			2			3	

Facility: Monticello			Date of Exam: 06-12-2015			
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.4	Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc.	3.3	66		
	2.1.17	Ability to make accurate, clear, and concise verbal reports.	3.9	67		
	2.1.45	Ability to identify and interpret diverse indications to validate the response of another indication.	4.3	68		
	2.1.2	Knowledge of operator responsibility during all modes of operation			4.4	94
	2.1.39	Knowledge of conservative decision making practices.			4.3	95
	Subtotal				3	2
2. Equipment Control	2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	4.5	69		
	2.2.15	Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc.	3.9	70		
	2.2.39	Knowledge of less than or equal to one hour Technical Specification action statements for systems	3.9	71		
	2.2.35	Ability to determine technical specification mode of operation.			4.5	96
	2.2.43	Knowledge of the process used to track inoperable alarms.			3.3	97
	Subtotal				3	2
3. Radiation Control	2.3.5	Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	72		
	2.3.7	Ability to comply with radiation work permits during normal or abnormal conditions.	3.5	73		
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.			3.8	98
	Subtotal				2	
4. Emergency Procedures / Plan	2.4.26	Knowledge of facility protection requirements, including fire brigade and portable firefighting equipment usage.	3.1	74		
	2.4.27	Knowledge of "fire in the plant" procedures.	3.4	75		
	2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations			4.4	99
	2.4.28	Knowledge of procedure related to a security event (non-safeguards information).			4.1	100
	Subtotal				2	2
Tier 3 Point Total				10		7