

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

- Note:
- 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).
 - 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.
 - 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.
 - 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.
 - 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.
 - Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
 - * 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.
 - 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.
 - 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.

ES-401		BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)						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		0 1					Recirculation System	3. 6	1
295003 Partial or Complete Loss of AC / 6	0 4						Electrical bus divisional separation	3. 1	1
295004 Partial or Total Loss of DC Pwr / 6					0 1		Cause of partial or complete loss of D.C. Power	3. 2	1
295005 Main Turbine Generator Trip / 3				0 1		0 4	RO: Recirculation system: Plant-Specific SRO G 2.4.46	3. 1/ 4. 2	1/1
295006 SCRAM / 1	0 3						Reactivity Control	3. 7	1
295016 Control Room Abandonment / 7						0 4	G 2.4.34 Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	4. 2	1
295018 Partial or Total Loss of CCW / 8				0 2			System Loads	3. 3	1
295019 Partial or Total Loss of Inst. Air / 8					0 2		Status of safety-related instruments air system loads (see AK2.1-AK2.19)	3. 6	1
295021 Loss of Shutdown Cooling / 4		0 7					Reactor recirculation	3. 1	1
295023 Refueling Acc / 8					0 4	0 4	RO: Occurrence of fuel handling accident SRO:G 2.4.30 Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.	3. 4/ 4. 1	1/1
295024 High Drywell Pressure / 5			0 7		0 2		RO: Drywell Venting SRO: Drywell temperature	3. 5/ 4. 0	1/1
295025 High Reactor Pressure / 3	0 3						Safety/relief valve tailpipe temperature/pressure relationships	3. 6	1
295026 Suppression Pool High Water Temp. / 5				0 3			Temperature Monitoring	3. 9	1
295027 High Containment Temperature / 5									0
295028 High Drywell Temperature / 5						0 4	G 2.4.31 Knowledge of annunciator alarms, indications, or response procedures	4. 2	1
295030 Low Suppression Pool Wtr Lvl / 5				0 2		0 1	RO: RCIC: Plant Specific SRO: G 2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation.	3. 4/ 4. 4	1/1

295031 Reactor Low Water Level / 2			0 4			0 2	RO: Steam cooling SRO: G 2.2.40 Ability to apply Technical Specifications for a system	4. 0/ 4. 7	1/1
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1						0 1	G 2.1.19 Ability to use plant computers to evaluate system or component status	3. 9	1
295038 High Off-site Release Rate / 9		1 0				0 2	RO: Condenser air removal system SRO A2: Total number of curies released	3. 2/ 3. 3	1/1
600000 Plant Fire On Site / 8			0 4			0 9	RO: Actions contained in the abnormal procedure for plant fire on site. SRO: A2: That a failed fire alarm detector exists	2. 8/ 2. 8	1/1
700000 Generator Voltage and Electric Grid Disturbances / 6			0 1				Reactor and turbine trip criteria	3. 9	1
K/A Category Totals:	3	3	4	4	3	3	Group Point Total:		20/7

ES-401		BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO)							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	#	
295002 Loss of Main Condenser Vac / 3										
295007 High Reactor Pressure / 3			0 5				Low pressure system isolation	3. 0	1	
295008 High Reactor Water Level / 2										
295009 Low Reactor Water Level / 2					0 1		SRO: Reactor water level	4. 2	1	
295010 High Drywell Pressure / 5										
295011 High Containment Temp / 5										
295012 High Drywell Temperature / 5										
295013 High Suppression Pool Temp. / 5										
295014 Inadvertent Reactivity Addition / 1										
295015 Incomplete SCRAM / 1				0 3			RMCS: Plant-specific	3. 6	1	
295017 High Off-site Release Rate / 9					0 4		Source of off-site release	3. 6	1	
295020 Inadvertent Cont. Isolation / 5 & 7						0 4	SRO: G 2.4.35 Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.	4. 0	1	
295022 Loss of CRD Pumps / 1						0 2	SRO: G 2.2.37 Ability to determine operability and/or availability of safety related equipment.	4. 6	1	
295029 High Suppression Pool Wtr Lvl / 5	0 1						Containment integrity	3. 4	1	
295032 High Secondary Containment Area Temperature / 5										
295033 High Secondary Containment Area Radiation Levels / 9	0 3						Radiation releases	3. 9	1	
295034 Secondary Containment Ventilation High Radiation / 9										
295035 Secondary Containment High Differential Pressure / 5						0 1	G 2.1.20 Ability to interpret and execute procedure steps	4. 6	1	
295036 Secondary Containment High Sump/Area Water Level / 5										
500000 High CTMT Hydrogen Conc. / 5		0 1					Containment hydrogen monitoring systems	3. 1	1	
K/A Category Point Totals:										
	2	1	1	1	1	1	Group Point Total:		7/3	

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / SRO)											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						1 2						ECCS room integrity	2.7	1
205000 Shutdown Cooling							0 2					SDC/RHR pump flow	3.3	1
206000 HPCI												N/A LaSalle		0
207000 Isolation (Emergency) Condenser												N/A LaSalle		0
209001 LPCS									0 1		0 2	RO: Valve Operation SRO: G 2.2.36 Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations	3.6 4.2	1/1
209002 HPCS											0 4	G 2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.	4.1	1
211000 SLC			0 2									Core spray line break detection system: Plant Specific	3.0	1
212000 RPS	1 5						0 4					Scram air header pressure RPS bus voltage: Plant Specific	3.8 2.8	2
215003 IRM		0 1				0 4						IRM channels/detectors Detectors	2.5 3.0	2
215004 Source Range Monitor					0 3			0 3				Changing detector position Stuck detector	2.8 3.0	2
215005 APRM / LPRM		0 2			0 5							APRM channels Core flow effect on APRM trip setpoints	2.6 3.6	2
217000 RCIC											0 1	G 2.1.27 Knowledge of system purpose and/or function	3.9	1
218000 ADS								0 3			0 3	RO: A4.03 ADS logic reset SRO A2:03 Loss of air supply to ADS valves: Plant-Specific	4.2 3.6	1/1
223002 PCIS/Nuclear Steam Supply Shutoff											0 1	Valve closures	3.6	1
239002 SRVs									0 3			Tailpipe temperature	3.6	1

259002 Reactor Water Level Control									0 4						0 4	RO: RFP runout condition: Plant Specific SRO: G 2.4.20 Knowledge of the operational implications of EOP warnings, cautions, and notes.	3.0 4.3	1/1
261000 SGTS				0 3												Moisture removal	2.5	1
262001 AC Electrical Distribution				0 5										0 2	Paralleling of A.C. sources (synchroscope) G 2.2.12 Knowledge of surveillance procedures	3.4 3.7	2	
262002 UPS (AC/DC)			0 8													Computer operation: Plant Specific	2.7	1
263000 DC Electrical Distribution							0 1									A.C. electrical distribution	3.2	1
264000 EDGs									0 8						0 4	RO: Initiation of emergency generator room fire protection system SRO: G 2.4.50 Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3 4.0	1/1
300000 Instrument Air	0 2															Service air	2.7	1
400000 Component Cooling Water			0 1						0 4							RO: K3: Loads cooled by CCWS SRO: A2: Radiation monitoring system alarm	2.9 3.0	1/1
K/A Category Point Totals:	2	2	3	2	2	3	2	3 / 2	2	2	3 / 3	Group Point Total:					26/5	

286000 Fire Protection											0 4	G 2.4.47 Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	1
288000 Plant Ventilation				0 1								Automatic initiation of standby gas treatment system	3.7	1
290001 Secondary CTMT														0
290003 Control Room HVAC														0
290002 Reactor Vessel Internals								0 6				Exceeding safety limits	4.0	1
K/A Category Point Totals:	1	1	1	1	1	1	1	2/ 1	1	1	1 / 2	Group Point Total:		12/3