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

ES-401 BWR Examination Outline Form ES-401-1
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)

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					X		**Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: AA2.01 Power/flow map**	3.5	46 H
295003 Partial or Complete Loss of AC / 6				X			**Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: AA1.04 D.C. electrical distribution system**	3.6	47 H
295004 Partial or Total Loss of DC Pwr / 6	X						**Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: AK1.05 Loss of breaker protection**	3.3	48 F
295005 Main Turbine Generator Trip / 3			X				**Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: AK3.03 Feedwater temperature decrease**	2.8	49 H
295006 SCRAM / 1					X		**Ability to determine and/or interpret the following as they apply to SCRAM: AA2.01 Reactor power**	4.5	50 H
295016 Control Room Abandonment / 7			X				**Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT: AK3.03 Disabling control room controls**	3.5	55 F
295018 Partial or Total Loss of CCW / 8		X					**Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER and the following: AK2.01 System loads**	3.3	56 F
295019 Partial or Total Loss of Inst. Air / 8		X					**Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR and the following: AK2.09 Containment**	3.3	57 H
295021 Loss of Shutdown Cooling / 4			X				**Knowledge of the reasons for the following responses as they apply to LOSS OF SHUTDOWN COOLING: AK3.01 Raising reactor water level**	3.3	58 F
295023 Refueling Acc / 8									
295024 High Drywell Pressure / 5						X	**2.4.18 Knowledge of the specific bases for EOPs**	3.3	59 F

295025 High Reactor Pressure / 3		X					**Knowledge of the interrelations between HIGH REACTOR PRESSURE and the following: EK2.08 Reactor/turbine pressure regulating system**	3.7	60 H
295026 Suppression Pool High Water Temp. / 5						X	**2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation**	4.4	61 H
295027 High Containment Temperature / 5					X		**Ability to determine and/or interpret the following as they apply to HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY): EA2.01 Containment temperature: Mark-III**	3.7	62 F
295028 High Drywell Temperature / 5						X	**2.1.20 Ability to interpret and execute procedure steps**	4.6	63 H
295030 Low Suppression Pool Wtr Lvl / 5	X						**Knowledge of the operational implications of the following concepts as they apply to LOW SUPPRESSION POOL WATER LEVEL: EK1.02 Pump NPSH**	3.5	64 F
295031 Reactor Low Water Level / 2			X				**Knowledge of the reasons for the following responses as they apply to REACTOR LOW WATER LEVEL: EK3.02 Core coverage**	4.4	65 H
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1			X				**Knowledge of the reasons for the following responses as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: EK3.07 Various alternate methods of control rod insertion**	4.2	69 H
295038 High Off-site Release Rate / 9	X						**Knowledge of the operational implications of the following concepts as they apply to HIGH OFF-SITE RELEASE RATE: EK1.02 Protection of the general public**	4.2	70 F
600000 Plant Fire On Site / 8				X			**Ability to operate and / or monitor the following as they apply to PLANT FIRE ON SITE: AA1.05 Plant and control room ventilation systems**	3.0	74 H
700000 Generator Voltage and Electric Grid Disturbances / 6			X				**Knowledge of the reasons for the following responses as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: AK3.02 Actions contained in abnormal operating procedure for voltage and grid disturbances**	3.6	75 F
K/A Category Totals:	3	3	6	2	3	3	Group Point Total:		20

ES-401 BWR Examination Outline Form ES-401-1
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)

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		X					**Knowledge of the interrelations between HIGH REACTOR PRESSURE and the following: AK2.05 Shutdown cooling**	2.9	51 F
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 5		X					**Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following: AK2.01 Suppression pool level**	3.2	52 H
295011 High Containment Temp / 5									
295012 High Drywell Temperature / 5				X			**Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE: AA1.02 Drywell cooling system**	3.8	53 H
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1									
295015 Incomplete SCRAM / 1	X						**Knowledge of the operational implications of the following concepts as they apply to INCOMPLETE SCRAM: AK1.04 Reactor pressure**	3.8	54 H
295017 High Off-site Release Rate / 9									
295020 Inadvertent Cont. Isolation / 5 & 7									
295022 Loss of CRD Pumps / 1									
295029 High Suppression Pool Wtr Lvl / 5									
295032 High Secondary Containment Area Temperature / 5						X	**2.2.12 Knowledge of surveillance procedures**	3.7	66 H
295033 High Secondary Containment Area Radiation Levels / 9			X				**Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS: EK3.02 Reactor SCRAM**	3.5	67 F
295034 Secondary Containment Ventilation High Radiation / 9									
295035 Secondary Containment High Differential Pressure / 5									

295036 Secondary Containment High Sump/Area Water Level / 5				X			**Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL: EA1.02 Affected systems so as to isolate damaged portions**	3.5	68 H
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals:	1	2	1	2	0	1	Group Point Total:		7

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 1 (RO)												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									X			**Ability to monitor automatic operations of the RHR/LPCI: INJECTION MODE, including: A3.05 Reactor water level**	4.4	12 H
205000 Shutdown Cooling					X							**Knowledge of the operational implications of the following concepts as they apply to SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE): K5.02 Valve operation**	2.8	15 F
										X		**Ability to manually operate and/or monitor in the control room: A4.12 Recirculation loop temperatures**	3.4	14 F
206000 HPCI												N/A GGNS, BWR-6		
207000 Isolation (Emergency) Condenser												N/A GGNS, BWR-6		
209001 LPCS			X									**Knowledge of the effect that a loss or malfunction of the LOW PRESSURE CORE SPRAY SYSTEM will have on following: K3.02 ADS logic**	3.8	16 H
209002 HPCS				X								**Knowledge of HIGH PRESSURE CORE SPRAY SYSTEM (HPCS)design feature(s) and/or interlocks which provide for the following: K4.01 Prevents water hammer**	2.9	17 F
211000 SLC							X					**Ability to predict and/or monitor changes in parameters associated with operating the STANDBY LIQUID CONTROL SYSTEM controls including: A1.10 Lights and alarms**	3.7	18 F
212000 RPS		X										**Knowledge of electrical power supplies to the following: K2.01 RPS motor-generator sets**	3.2	19 H
215003 IRM			X									**Knowledge of the effect that a loss or malfunction of the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM will have on following: K3.04 Reactor power indication**	3.6	20 H

215004 Source Range Monitor				X							**Knowledge of SOURCE RANGE MONITOR (SRM) SYSTEM design feature(s) and/or interlocks which provide for the following: K4.06 IRM/SRM interlock**	3.2	22 H
										X	**2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation**	4.3	21 F
215005 APRM / LPRM							X				**Ability to predict and/or monitor changes in parameters associated with operating the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM controls including: A1.01 Reactor power indication**	4.0	23 F
217000 RCIC					X						**Knowledge of the operational implications of the following concepts as they apply to REACTOR CORE ISOLATION COOLING SYSTEM (RCIC): K5.02 Flow indication**	3.1	24 F
						X					**Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC): K6.04 Condensate storage and transfer system**	3.5	25 H
218000 ADS					X						**Knowledge of the operational implications of the following concepts as they apply to AUTOMATIC DEPRESSURIZATION SYSTEM: K5.01 ADS logic operation**	3.8	26 H
223002 PCIS/Nuclear Steam Supply Shutoff						X					**Knowledge of the effect that a loss or malfunction of the following will have on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF: K6.07 Essential A.C. power**	3.2	29 H
239002 SRVs										X	**2.1.20 Ability to interpret and execute procedure steps**	4.6	32 H
								X			**Ability to (a) predict the impacts of the following on the RELIEF/SAFETY VALVES; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.06 Reactor high pressure**	4.1	33 H

259002 Reactor Water Level Control	X											**Knowledge of the physical connections and/or cause effect relationships between REACTOR WATER LEVEL CONTROL SYSTEM and the following: K1.05 Reactor feedwater system**	3.6	36 H
261000 SGTS										X		**Ability to manually operate and/or monitor in the control room: A4.06 Reactor building differential pressure**	3.3	37 H
262001 AC Electrical Distribution									X			**Ability to monitor automatic operations of the A.C. ELECTRICAL DISTRIBUTION including: A3.04 Load sequencing**	3.4	38 F
262002 UPS (AC/DC)											X	**2.2.6 Knowledge of the process for making changes to procedures**	3.0	39 F
263000 DC Electrical Distribution			X									**Knowledge of the effect that a loss or malfunction of the D.C. ELECTRICAL DISTRIBUTION will have on following: K3.03 Systems with D.C. components (i.e. valves, motors, solenoids, etc.)**	3.4	40 H
264000 EDGs							X					**Ability to predict and/or monitor changes in parameters associated with operating the EMERGENCY GENERATORS (DIESEL/JET) controls including: A1.03 Operating voltages, currents, and temperatures**	2.8	41 F
300000 Instrument Air		X										**Knowledge of electrical power supplies to the following: K2.01 Instrument air compressor**	2.8	71 H
400000 Component Cooling Water				X								**Knowledge of CCWS design feature(s) and or interlocks which provide for the following: K4.01 Automatic start of standby pump**	3.4	72 H
						X						**Knowledge of the effect that a loss or malfunction of the following will have on the CCWS: K6.01 Valves**	2.7	73 F
K/A Category Point Totals:	1	2	3	3	3	3	3	1	2	2	3	Group Point Total:		26

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 2 (RO)												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	#
201001 CRD Hydraulic														
201002 RMCS												N/A GGNS, BWR-6		
201003 Control Rod and Drive Mechanism														
201004 RSCS												N/A GGNS, BWR-6		
201005 RCIS														
201006 RWM												N/A GGNS, BWR-6		
202001 Recirculation														
202002 Recirculation Flow Control										X		**Ability to manually operate and/or monitor in the control room: A4.09 Core flow**	3.2	11 H
204000 RWCU				X								**Knowledge of REACTOR WATER CLEANUP SYSTEM design feature(s) and/or interlocks which provide for the following: K4.07 Draining of reactor water to various locations**	2.9	13 H
214000 RPIS												N/A GGNS, BWR-6		
215001 Traversing In-core Probe														
215002 RBM												N/A GGNS, BWR-6		
216000 Nuclear Boiler Inst.														
219000 RHR/LPCI: Torus/Pool Cooling Mode									X			**Ability to monitor automatic operations of the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE including: A3.01 Valve operation**	3.3	27 H
223001 Primary CTMT and Aux.		X										**Knowledge of electrical power supplies to the following: K2.09 Drywell cooling fans**	2.7	28 F
226001 RHR/LPCI: CTMT Spray Mode							X					**Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE controls including: A1.10 Emergency generator loading**	3.0	30 H
230000 RHR/LPCI: Torus/Pool Spray Mode												N/A GGNS, BWR-6		

233000 Fuel Pool Cooling/Cleanup	X										**Knowledge of the physical connections and/or cause effect relationships between FUEL POOL COOLING AND CLEAN-UP and the following: K1.02 Residual heat removal system**	2.9	31 H
234000 Fuel Handling Equipment													
239001 Main and Reheat Steam													
239003 MSIV Leakage Control													
241000 Reactor/Turbine Pressure Regulator													
245000 Main Turbine Gen. / Aux.													
256000 Reactor Condensate								X			**Ability to (a) predict the impacts of the following on the REACTOR CONDENSATE SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.08 High feedwater heater level**	3.1	34 F
259001 Reactor Feedwater									X		**Ability to monitor automatic operations of the REACTOR FEEDWATER SYSTEM including: A3.10 Pump trips**	3.4	35 H
268000 Radwaste													
271000 Offgas													
272000 Radiation Monitoring													
286000 Fire Protection				X							**Knowledge of FIRE PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: K4.02 Automatic system initiation**	3.3	42 F
288000 Plant Ventilation										X	**2.4.2 Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions**	4.5	43 H
290001 Secondary CTMT													
290003 Control Room HVAC										X	**2.1.27 Knowledge of system purpose and/or function**	3.9	45 F
290002 Reactor Vessel Internals	X										**Knowledge of the physical connections and/or cause effect relationships between REACTOR VESSEL INTERNALS and the following: K1.20 Nuclear instrumentation**	3.2	44 F
K/A Category Point Totals:	2	1	0	2	0	0	1	1	2	1	2	Group Point Total:	12

Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.18	**Ability to make accurate, clear, and concise logs, records, status boards, and reports**	3.6	1 F		
	2.1.30	**Ability to locate and operate components, including local controls**	4.4	2 F		
	2.1.38	**Knowledge of the station's requirements for verbal communications when implementing procedures .**	3.7	3 H		
	Subtotal			3		
2. Equipment Control	2.2.14	**Knowledge of the process for controlling equipment configuration or status**	3.9	4 F		
	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	5 H		
	Subtotal			2		
3. Radiation Control	2.3.7	**Ability to comply with radiation work permit requirements during normal or abnormal conditions**	3.5	6 H		
	2.3.11	**Ability to control radiation releases**	3.8	7 H		
	2.3.13	**Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc**	3.4	8 F		
	Subtotal			3		
4. Emergency Procedures / Plan	2.4.18	**Knowledge of the specific bases for EOPs**	3.3	9 F		
	2.4.28	**Knowledge of procedures relating to a security event (non-safeguards information)**	3.2	10 F		
	Subtotal			2		
Tier 3 Point Total				10		

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	295004 AK3.03	Regarding the entire AK3 category of system 295004, given GGNS operating procedures and expectations, there are no possible operationally-valid questions. Randomly re-selected within system 295004. [Replaced by 295004 AK1.05.]
1/1	295026 2.1.27	Mismatch between this KA (System Purpose/Function) and the APE for 295026. [Replaced by 295026 2.1.7.]
1/1	295028 2.1.27	Mismatch between this KA (System Purpose/Function) and the APE for 295028. [Replaced by 295028 2.1.20.]
1/1	295027 EA2.02	Already used containment temperature versus containment pressure concept in developing question for 295019 AK2.09 (overlap problem). [Replaced by 295027 EA2.01.]
½	295033 EK1.02	Could not develop an operationally valid question at the RO level for this KA statement (or for statement EK1.03, the only other statement with a 2.5 or greater rating). Randomly and systematically re-selected across the KA categories. [Replaced by 295033 EK3.02.]
½	295036 EA1.01	At GGNS, there are no indications/controls for secondary containment equipment/floor drain systems in the control room (in-field equipment operated by non-licensed operators). [Replaced by 295036 EA1.02.]
2/1	215005 A1.05	Could not develop an operationally valid and discriminating question for this KA statement. Randomly re-selected across this KA category. [Replaced by 215005 A1.01.]
2/1	239002 A2.03	Another question was already created for 239002 2.1.20. That question contrasts a stuck open SRV with a leaky SRV within its stem conditions and answer choices (i.e., too much overlap). [Replaced by 239002 A2.06.]
2/1	262002 2.2.22	At GGNS, UPS inverters are not Tech Spec components; i.e., no LCO or Safety Limit connection as indicated by this KA. [Replaced by 262002 2.2.6.]

2/1	263000 A2.01	Given the body of GGNS procedures and other controlled references accessible in the control room, there is no information available to substantiate the "consequences" component of this KA. Additionally, the "mitigating actions" component of this KA is beyond a "from memory" expectation, and could only be presented as a Direct Lookup (unacceptable per NUREG-1021). The only remaining A2 statement within this system (A2.02) was considered but discounted because there are no GGNS operating procedures that address specific actions to be taken in the event of a loss of ventilation during a battery charge. Randomly re-selected across the categories within this system. [Replaced by 263000 K3.03.]
2/1	264000 A1.01	At GGNS, there are no control room indications/controls associated with EDG lube oil temperature. [Replaced by 264000 A1.03.]
2/1	300000 A4.01	At GGNS there is only a single control room indication (pressure gauge) for Instrument Air, and this indicator provides insufficient substance for an operationally-valid exam question. Because this is the sole A4 statement within system 300000, randomly-reselected across the categories within 300000. [Replaced by 300000 K2.01.]
2/2	256000 K5.01	After initial sampling, recognized a shortage of A2's (for required Tier total). Re-selected among the A2 category to correct this problem. [Replaced by 256000 A2.08.]
2/2	286000 K5.02	Across this entire KA category, could not develop an operationally valid question. Randomly and systematically re-selected across the other KA categories. [Replaced by 286000 K4.02.]

Facility: Date of Exam:

Tier	Group	RO K/A Category Points											SRO-Only Points		
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	2												7	1	2	3
	Tier Totals												27	5	5	10
2. Plant Systems	1												26	1	4	5
	2												12	1	2	3
	Tier Totals												38	2	6	8
3. Generic Knowledge and Abilities Categories		1			2			3			4		10	1	2	3	4	7
														1	2	2	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).
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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.

ES-401 BWR Examination Outline Form ES-401-1
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)

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						X	**2.4.41 Knowledge of the emergency action level thresholds and classifications**	4.6	85 H
295003 Partial or Complete Loss of AC / 6									
295004 Partial or Total Loss of DC Pwr / 6									
295005 Main Turbine Generator Trip / 3									
295006 SCRAM / 1									
295016 Control Room Abandonment / 7									
295018 Partial or Total Loss of CCW / 8									
295019 Partial or Total Loss of Inst. Air / 8						X	**2.1.19 Ability to use plant computers to evaluate system or component status**	3.8	83 F
295021 Loss of Shutdown Cooling / 4									
295023 Refueling Acc / 8					X		**Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS: AA2.05 Entry conditions of emergency plan**	4.6	82 H
295024 High Drywell Pressure / 5									
295025 High Reactor Pressure / 3									
295026 Suppression Pool High Water Temp / 5									
295027 High Containment Temperature / 5									
295028 High Drywell Temperature / 5									
295030 Low Suppression Pool Wtr Lvl / 5						X	**2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation**	4.7	81 H
295031 Reactor Low Water Level / 2									
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1					X		**Ability to determine and/or interpret the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: EA2.02 Reactor water level**	4.2	78 H
295038 High Off-site Release Rate / 9									
600000 Plant Fire On Site / 8					X		**Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: AA2.17 Systems that may be affected by the fire**	3.6	77 H

700000 Generator Voltage and Electric Grid Disturbances / 6					X		**Ability to determine and/or interpret the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: AA2.05 Operational status of offsite circuit**	3.8	76 H
K/A Category Totals:					4	3	Group Point Total:		7

ES-401 BWR Examination Outline Form ES-401-1
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)

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									
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2									
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									
295017 High Off-site Release Rate / 9					X		**Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE: AA2.03 Radiation levels**	3.9	84 H
295020 Inadvertent Cont. Isolation / 5 & 7									
295022 Loss of CRD Pumps / 1									
295029 High Suppression Pool Wtr Lvl / 5									
295032 High Secondary Containment Area Temperature / 5						X	**2.2.22 Knowledge of limiting conditions for operations and safety limits**	4.7	80 H
295033 High Secondary Containment Area Radiation Levels / 9									
295034 Secondary Containment Ventilation High Radiation / 9									
295035 Secondary Containment High Differential Pressure / 5									
295036 Secondary Containment High Sump/Area Water Level / 5						X	**2.4.6 Knowledge of EOP mitigation strategies**	4.7	79 H
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals:					1	2	Group Point Total:		3

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 1 (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														
205000 Shutdown Cooling														
206000 HPCI												N/A GGNS, BWR-6		
207000 Isolation (Emergency) Condenser												N/A GGNS, BWR-6		
209001 LPCS														
209002 HPCS														
211000 SLC														
212000 RPS								X				**Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.21 Failure of individual relays to reposition**	3.9	100 H
215003 IRM														
215004 Source Range Monitor											X	**2.2.25 Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits**	4.2	92 F
215005 APRM / LPRM														
217000 RCIC														
218000 ADS														
223002 PCIS/Nuclear Steam Supply Shutoff														
239002 SRVs														
259002 Reactor Water Level Control														
261000 SGTS											X	**2.4.41 Knowledge of the emergency action level thresholds and classifications**	4.6	89 H
262001 AC Electrical Distribution											X	**2.4.41 Knowledge of the emergency action level thresholds and classifications**	4.6	88 H
262002 UPS (AC/DC)														

263000 DC Electrical Distribution													
264000 EDGs										X	**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	87 H
300000 Instrument Air													
400000 Component Cooling Water													
K/A Category Point Totals:							1			4	Group Point Total:		5

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 2 (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	#
201001 CRD Hydraulic														
201002 RMCS												N/A GGNS, BWR-6		
201003 Control Rod and Drive Mechanism														
201004 RSCS												N/A GGNS, BWR-6		
201005 RCIS														
201006 RWM												N/A GGNS, BWR-6		
202001 Recirculation														
202002 Recirculation Flow Control														
204000 RWCU														
214000 RPIS												N/A GGNS, BWR-6		
215001 Traversing In-core Probe														
215002 RBM												N/A GGNS, BWR-6		
216000 Nuclear Boiler Inst.														
219000 RHR/LPCI: Torus/Pool Cooling Mode														
223001 Primary CTMT and Aux.								X				**Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.04 High containment/drywell hydrogen concentration**	3.8	91 H
226001 RHR/LPCI: CTMT Spray Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode												N/A GGNS, BWR-6		
233000 Fuel Pool Cooling/Cleanup														
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam														
239003 MSIV Leakage Control														
241000 Reactor/Turbine Pressure Regulator											X	**2.1.20 Ability to interpret and execute procedure steps**	4.6	90 H
245000 Main Turbine Gen. / Aux.														
256000 Reactor Condensate														
259001 Reactor Feedwater														

268000 Radwaste										X	**2.2.40 Ability to apply Technical Specifications for a system**	4.7	86 H
271000 Offgas													
272000 Radiation Monitoring													
286000 Fire Protection													
288000 Plant Ventilation													
290001 Secondary CTMT													
290003 Control Room HVAC													
290002 Reactor Vessel Internals													
K/A Category Point Totals:							1			2	Group Point Total:		3

Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.35	**2.1.35 Knowledge of the fuel-handling responsibilities of SROs**			3.9	93 H
	Subtotal					1
2. Equipment Control	2.2.11	**2.2.11 Knowledge of the process for controlling temporary design changes**			3.3	94 F
	2.2.22	**2.2.22 Knowledge of limiting conditions for operations and safety limits**			4.7	95 H
	Subtotal					2
3. Radiation Control	2.3.11	**2.3.11 Ability to control radiation releases**			4.3	96 F
	2.3.14	**2.3.14 Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities**			3.8	97 F
	Subtotal					2
4. Emergency Procedures / Plan	2.4.30	**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**			4.1	98 F
	2.4.38	**2.4.38 Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required**			4.4	99 F
	Subtotal					2
Tier 3 Point Total						7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	295018 2.4.9	Regarding the entire 295018 topic, there are no A2 or eligible generic KAs that, when compared to GGNS procedures and operating expectations, belong exclusively to the SRO. Randomly re-selected a substitute topic (295023) and then randomly re-selected the KA statement. [Replaced by 295023 AA2.05.]
1/1	295037 EA2.03	Regarding the ability to determine/interpret SLC Tank level during an ATWS, there are no Emergency Procedure (or supporting procedure) expectations/actions that are exclusively the SRO's. [Replaced by 295037 EA2.02.]
1/1	600000 AA2.16	Regarding the ability to determine/interpret the vital equipment and control systems to be operated and maintained during a fire in plant, there are no procedural expectations/actions that are exclusively the SRO's. [Replaced by 600000 AA2.17.]
2/1	262002 2.2.36	Regarding the entire 262002 system, there are no eligible generic KAs that, when compared to GGNS procedures and operating expectations, belong exclusively to the SRO. Randomly re-selected a substitute topic (262001) and then randomly re-selected an eligible generic KA. [Replaced by 262001 2.4.41.]
3	2.1.7	Regarding the evaluation of plant performance and the making of operational judgments based on operating characteristics, reactor behavior, and instrument interpretation, this KA was one of the last to be worked by the exam developers. As such, the developers chose not to put another Tech Spec LCO Action species of question on this exam. Aside from Tech Specs, there are no other avenues to pursue this KA in an SRO-only setting. [Replaced by 2.1.35.]
3	2.4.12	Regarding the knowledge of general operating crew responsibilities during EOP usage, there are no procedural expectations/actions that are exclusively the SRO's. [Replaced by 2.4.38.]
2/2	223001 A2.13	Could not develop a quality, discriminating SRO-level question for this KA; the actions taken in the CTMT temperature leg of EP-3 lack sufficient substance for such. Randomly and systematically re-selected within the A2 category. [Replaced by 223001 A2.04.]