

Facility: SUSQUEHANNADate of Exam 8/09-8/13 2004

Tier	Group	RO K/A Category Points											TOTAL
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	4	3	4				4	2			3	20
	2	0	1	2				1	3			0	7
	Tier Totals	4	4	6				5	5			3	27
2. Plant Systems	1	1	0	4	3	0	3	2	3	3	4	3	26
	2	1	2	2	0	2	1	2	1	1	0	0	12
	Tier Totals	2	2	6	3	2	4	4	4	4	4	3	38
3. Generic Knowledge and Abilities Categories					1			2		3		4	10
					3			2		2		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.

ES-401		BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1(RO)						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 (Q1)					X		AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : AA2.02 Neutron monitoring	3.1	1
295003 Partial or Complete Loss of AC / 6 (Q2)			X				AK3. Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : AK3.01 Manual and auto bus transfer	3.3	1
295004 Partial or Total Loss of DC Pwr / 6 (Q3)		X					AK2. Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF D.C. POWER and the following: AK2.01 Battery charger	3.1	1
295005 Main Turbine Generator Trip / 3 (Q4)						X	2.4.11 Knowledge of abnormal condition procedures.	3.4	1
295005 Main Turbine Generator Trip / 3 (Q5)		X					AK2. Knowledge of the interrelations between MAIN TURBINE GENERATOR TRIP and the following: AK2.01 RPS	3.8	1
295006 SCRAM / 1 (Q6)	X						AK1. Knowledge of the operational implications of the following concepts as they apply to SCRAM : AK1.03 Reactivity control	3.7	1
295016 Control Room Abandonment / 7 (Q7)					X		AA2. Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT : AA2.01 Reactor power	4.1	1
295018 Partial or Total Loss of CCW / 8 (Q8)	X						AK1. Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : AK1.01 Effects on component/system operations	3.5	1
295019 Partial or Total Loss of Inst. Air / 8 (Q9)				X			AA1. Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : AA1.02 Instrument air system valves:	3.3	1
295021 Loss of Shutdown Cooling / 4 (Q10)						X	2.4.9 Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.	3.3	1
295023 Refueling Accidents Cooling Mode / 8 (Q11)			X				AK3. Knowledge of the reasons for the following responses as they apply to REFUELING ACCIDENTS : AK3.02 Interlocks associated with fuel handling equipment	3.4	1

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295024 High Drywell Pressure / 5 (Q12)			X				EK3. Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE : EK3.05 †RPV flooding	3.5	1
295025 High Reactor Pressure / 3 (Q13)				X			EA1. Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE: EA1.05 RCIC: Plant-Specific	3.7	1
295026 Suppression Pool High Water Temp. / 5 (Q14)	X						EK1. Knowledge of the operational implications of the following concepts as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE : EK1.02 Steam condensation	3.5	1
295028 High Drywell Temperature / 5 (Q15)				X			EA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE : EA1.05 ADS	3.7	1
295030 Low Suppression Pool Water Level / 5 (Q16)						X	2.4.48 Ability to interpret control room indications to verify the status and operation of system / and understand how operator action s and directives affect plant and system conditions.	3.5	1
95031 Reactor Low Water Level / 2 (Q17)	X						EK1. Knowledge of the operational implications of the following concepts as they apply to REACTOR LOW WATER LEVEL : EK1.02 Natural circulation: Plant-Specific	3.8	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1 (Q18)			X				EK3. Knowledge of the reasons for the following responses as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN : EK3.05 Cold shutdown boron weight: Plant-Specific	3.2	1
295038 High Off-site Release Rate / 9 (Q19)		X					EK2. Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: EK2.03 Plant ventilation systems	3.6	1
600000 Plant Fire On Site / 8 (Q20)				X			AA1 Ability to operate and / or monitor the following as They apply to PLANT FIRE ON SITE: AA1.06 Fire alarm	3.0	1
K/A Category Totals:	4	3	4	4	2	3	Group Point Total:	20	

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 Vacuum / 3 (Q21)					X		AA2. Ability to determine and/or interpret the following as they apply to LOSS OF MAIN CONDENSER VACUUM : AA2.02 Reactor power: Plant-Specific	3.2	1
295009 Low Reactor Water Level / 2 (Q22)					X		AA2. Ability to determine and/or interpret the following as they apply to LOW REACTOR WATER LEVEL : AA2.02 Steam flow/feed flow mismatch	3.6	1
295020 Inadvertent Cont. Isolation / 5 & 7 (Q23)			X				AK3. Knowledge of the reasons for the following responses as they apply to INADVERTENT CONTAINMENT ISOLATION: AK3.05 Reactor water level response	3.8	1
295029 High Suppression Pool Water Level / 5 (Q24)		X					EK2. Knowledge of the interrelations between HIGH SUPPRESSION POOL WATER LEVEL and the following: EK2.02 HPCI: Plant-Specific	3.4	1
295032 High Secondary Containment Area Temperature / 5 (Q25)			X				EK3. Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE : EK3.03 Isolating affected systems	3.8	1
295033 High Secondary Containment Area Radiation Levels / 9 (Q26)				X			EA1. Ability to operate and/or monitor the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS : EA1.08 Control room ventilation: Plant-Specific	3.6	1
295035 Secondary Containment High Differential Pressure / 5 (Q27)					X		EA2. Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: EA2.02 † Off-site release rate: Plant-Specific	2.8	1
K/A Category Point Totals:	0	1	2	1	3	0	Group Point Total:		7

ES-401		BWR Examination Outline										Form ES-401-1		
Plant Systems - Tier 2/Group 1(RO)														
System #	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 (Q28)											X	2.2.24 Ability to analyze the affect of maintenance activities on LCO status.	2.6	1
205000 Shutdown Cooling (Q29)									X			A3. Ability to monitor automatic operations of the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) including A3.03 Lights and alarms	3.5	1
206000 HPCI (Q30)				X								K4. Knowledge of HIGH PRESSURE COOLANT INJECTION SYSTEM design feature(s) and/or interlocks which provide for the following: K4.11 Turbine speed control: BWR-2,3,4	3.4	1
209001 LPCS (Q31)										X		A4. Ability to manually operate and/or monitor in the control room: A4.05 Manual initiation controls	3.8	1
211000 SLC (Q32)			X									K3. Knowledge of the effect that a loss or malfunction of the STANDBY LIQUID CONTROL SYSTEM will have on following: K3.02 Core spray line break detection system: Plant-Specific	3.0	1
212000 RPS (Q33)						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR PROTECTION SYSTEM : K6.05 RPS sensor inputs	3.5	1
212000 RPS (Q34)									X			A3. Ability to monitor automatic operations of the REACTOR PROTECTION SYSTEM including: A3.04 System status lights and alarms	3.9	1
215003 IRM (Q35)											X	2.2.2 Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4.0	1
215004 Source Range Monitor (Q36)			X									K3. Knowledge of the effect that a loss or malfunction of the SOURCE RANGE MONITOR (SRM) SYSTEM will have on following: K3.01 RPS	3.4	1

Plant Systems - Tier 2/Group 1(RO)

System #	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	#
215005 APRM / LPRM (Q37)											X	A4. Ability to manually operate and/or monitor in the control room: A4.06 Verification of proper functioning/ operability	3.6	1
217000 RCIC (Q38)											X	A4. Ability to manually operate and/or monitor in the control room: A4.05 Reactor water level	4.1	1
217000 RCIC (Q39)				X								K4. Knowledge of REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) design feature(s) and/or interlocks which provide for the following: K4.01 Prevent water hammer: Plant-Specific	2.8	1
218000 ADS (Q40)							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the AUTOMATIC DEPRESSURIZATION SYSTEM controls including: A1.01 ADS valve tail pipe temperatures	3.4	1
223002 PCIS/Nuclear Steam Supply Shutoff (Q41)			X									K3. Knowledge of the effect that a loss or malfunction of the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF will have on following: K3.21 Traversing in-core probe system	2.6	1
223002 PCIS/Nuclear Steam Supply Shutoff (Q42)											X	2.1.27 Knowledge of system purpose and or function.	2.8	1
239002 SRVs (Q43)			X									K3. Knowledge of the effect that a loss or malfunction of the RELIEF/SAFETY VALVES will have on following: K3.02 Reactor over pressurization	4.2	1
239002 SRVs (Q44)						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the RELIEF/SAFETY VALVES : K6.02 Air (Nitrogen) supply: Plant-Specific	3.4	1

Plant Systems - Tier 2/Group 1(RO)

System #	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	#
259002 Reactor Water Level Control (Q45)						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR WATER LEVEL CONTROL SYSTEM : K6.04 Reactor feedwater flow input	3.1	1
261000 SGTS (Q46)								X				A2. Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.11 High containment pressure	3.2	1
262001 AC Electrical Distribution (Q47)									X			A3. Ability to monitor automatic operations of the A.C. ELECTRICAL DISTRIBUTION including: A3.04 Load sequencing	3.4	1
262002 UPS (AC/DC) (Q48)				X								K4. Knowledge of UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) design feature(s) and/or interlocks which provide for the following: K4.01 Transfer from preferred power to alternate power supplies	3.1	1
263000 DC Electrical Distribution (Q49)								X				A2. Ability to (a) predict the impacts of the following on the D.C. ELECTRICAL DISTRIBUTION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.02 Loss of ventilation during charging	2.6	1
264000 EDGs (Q50)										X		A4. Ability to manually operate and/or monitor in the control room: A4.03 Transfer of emergency control between manual and automatic	3.2	1
300000 Instrument Air (Q51)	X											K1 Knowledge of the connections and / or cause effect relationships between INSTRUMENT AIR SYSTEM and the following: K1.04 Cooling water to compressor	2.8	1

Plant Systems - Tier 2/Group 1(RO)

System #	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	#
300000 Instrument Air (Q52)								X				A2. Ability to (a) predict the impacts of the following on the INSTRUMENT AIR SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: A2.01 Air dryer and filter malfunctions	2.9	1
400000 Component Cooling Water (Q53)							X					A1. Ability to predict and / or monitor changes in parameters associated with operating the CCWS controls including: A1.01 CCW flow rate	2.8	1
K/A Category Point Totals:	1	0	4	3	0	3	2	3	3	4	3	Group Point Total:	26	

Plant Systems - Tier 2/Group 2(RO)

System #	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 (Q54)		X										K2. Knowledge of electrical power supplies to the following: K2.02 Scram valve solenoids	3.6	1
201003 Control Rod and Drive Mechanism (Q55)							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the CONTROL ROD AND DRIVE MECHANISM controls including: A1.01 Reactor power	3.7	1
215002 RBM (Q56)					X							K5. Knowledge of the operational implications of the following concepts as they apply to ROD BLOCK MONITOR SYSTEM : K5.01 Trip reference selection: Plant-Specific	2.6	1
223001 Primary CTMT and Auxiliaries (Q57)									X			A3. Ability to monitor automatic operations of the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES including: A3.04 Containment/drywell response during LOCA	4.2	1
226001 RHR/LPCI: CTMT Spray Mode (Q58)								X				A2. Ability to (a) predict the impacts of the following on the RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.13 Valve logic failure	2.8	1
230000 RHR/LPCI: Torus/Pool Spray Mode (Q59)		X										K2. Knowledge of electrical power supplies to the following: K2.02 Pumps	2.8	1
241000 Reactor Turbine Pressure Regulating System (Q60)							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the REACTOR/TURBINE PRESSURE REGULATING SYSTEM controls including: A1.01 Reactor pressure	3.9	1
245000 Main Turbine Gen. and Auxiliaries (Q61)			X									K3. Knowledge of the effect that a loss or malfunction of the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS will have on following: K3.07 Reactor protection system	3.6	1

ES-401		BWR Examination Outline										Form ES-401-1		
Plant Systems - Tier 2/Group 2(RO)														
System #	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	#
272000 Radiation Monitoring (Q62)	X											K1. Knowledge of the physical connections and/or cause effect relationships between RADIATION MONITORING SYSTEM and the following: K1.06 Reactor building ventilation system: Plant-Specific	3.2	1
286000 Fire Protection (Q63)			X									K3. Knowledge of the effect that a loss or malfunction of the FIRE PROTECTION SYSTEM will have on following: K3.01 The ability to detect fires	3.2	1
288000 Plant Ventilation (Q64)					X							K5. Knowledge of the operational implications of the following concepts as they apply to PLANT VENTILATION SYSTEMS : K5.02 Differential pressure control	3.2	1
290001 Secondary CTMT (Q65)						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the SECONDARY CONTAINMENT : K6.04 Primary containment system	3.9	1
K/A Category Point Totals:	1	2	2	0	2	1	2	1	1	0	0	Group Point Total:	12	

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Category	K/A#	Topic	RO		
			IR	#	
1. Conduct of Operations	2.1 (Q66)	2.1.1 Knowledge of conduct of operations requirements.	3.7	1	
	2.1 (Q67)	2.1.28 Knowledge of the purpose and function of major system components and controls.	3.2	1	
	2.1 (Q68)	2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	3.4	1	
	Subtotal			3	
2. Equipment Control	2.2 (Q69)	2.2.12 Knowledge of surveillance procedures.	3.0	1	
	2.2 (Q70)	2.2.13 Knowledge of tagging and clearance procedures.	3.6	1	
	Subtotal			2	
3. Radiation Control	2.3 (Q71)	2.3.11 Ability to control radiation releases.	2.7	1	
	2.3 (Q72)	2.3.1 Knowledge of 10 CFR: 20 and related facility radiation control requirements.	2.6	1	
	Subtotal			2	
4. Emergency Procedures/ Plan	2.4 (Q73)	2.4.22 Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.	3.0	1	
	2.4 (Q74)	2.4.26 Knowledge of facility protection requirements including fire brigade and portable fire fighting equipment usage.	2.9	1	
	2.4 (Q75)	2.4.48 Ability to interpret control room indications to verify the status and operation of system / and understand how operator action s and directives affect plant and system conditions.	3.5	1	
	Subtotal			3	
Tier 3 Point Total				10	

Facility: SUSQUEHANNADate of Exam 8/09-8/13 2004

Tier	Group	SRO-ONLY Points				
		K	A	A 2	G *	TOTAL
1. Emergency & Abnormal Plant Evolutions	1	0	0	5	3	8
	2	0	0	3	1	4
	Tier Totals	0	0	8	4	12
2. Plant Systems	1	0	0	2	2	4
	2	0	0	2	0	2
	Tier Totals	0	0	4	2	6
3. Generic Knowledge and Abilities Categories		1	2	3	4	7
		1	2	2	2	

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Emergency and Abnormal Plant Evolutions - Tier 1/Group 1(SRO)									
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295005 Main Turbine Generator Trip / 3 (Q76)						X	2.2.1 Ability to perform pre-startup procedures for the facility / including operating those controls associated with plant equipment that could affect reactivity. (10CFR 55.43)	3.6	1
295016 Control Room Abandonment / 7 (Q77)						X	AA2. Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT : AA2.06 Cooldown rate (10CFR 55.43)	3.5	1
295019 Partial or Total Loss of Inst. Air / 8 (Q78)						X	AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : AA2.02 Status of safety-related instrument air system loads (10CFR 55.43)	3.7	1
295021 Loss of Shutdown Cooling / 4 (Q79)						X	AA2. Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING : AA2.07 Reactor recirculation flow (10CFR 55.43)	3.1	1
295023 Refueling Accidents Cooling Mode / 8 (Q80)						X	AA2. Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS : AA2.05 †Entry conditions of emergency plan (10CFR 55.43)	4.6	1
295024 High Drywell Pressure / 5 (Q81)						X	2.1.32 Ability to explain and apply system limits and precautions. (10CFR 55.43)	3.8	1
295026 Suppression Pool High Water Temp. / 5 (Q82)						X	EA2. Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: EA2.03 Reactor pressure (10CFR 55.43)	4.0	1
600000 Plant Fire On Site / 8 (Q83)						X	2.4.25 Knowledge of fire protection procedures. (10CFR 55.43)	3.4	1
K/A Category Totals:	0	0	0	0	5	3	Group Point Total:	8	

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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	#
295014 Inadvertent Reactivity Addition (Q84)					X		AA2. Ability to determine and/or interpret the following as they apply to INADVERTENT REACTIVITY ADDITION : AA2.03 Cause of reactivity addition (10CFR 55.43)	4.3	1
295032 High Secondary Containment Area Temperature / 5 (Q85)						X	2.1.20 Ability to execute procedure steps. (10CFR 55.43)	4.2	1
295036 Secondary Containment High Sump/Area Water Level / 5 (Q86)					X		EA2. Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL : EA2.03 Cause of the high water level (10CFR 55.43)	3.8	1
500000 High Containment Hydrogen Conc. / 5 (Q87)					X		EA2 Ability to determine and / or interpret the following as they apply to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS: EA2.03 Combustible limits for drywell (10CFR 55.43)	3.8	1
K/A Category Point Totals:	0	0	0	0	3	1	Group Point Total:	4	

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Plant Systems - Tier 2/Group 1(SRO)														
System #	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	#
211000 SLC (Q88)								X				A2. Ability to (a) predict the impacts of the following on the STANDBY LIQUID CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.03 A.C. power failures (10CFR 55.43)	3.4	1
212000 RPS (Q89)								X				A2. 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: A2.16 Changing mode switch position (10CFR 55.43)	4.1	1
239002 SRVs (Q90)											X	2.2.18 Knowledge of the process for managing maintenance activities during shutdown operations. (10CFR 55.43)	3.6	1
262001 AC Electrical Distribution (Q91)											X	2.2.6 Knowledge of the process for making changes in procedures as described in the safety analysis report. (10CFR 55.43)	3.3	1
K/A Category Point Totals:	0	0	0	0	0	0	0	2	0	0	2	Group Point Total:	4	

ES-401		BWR Examination Outline										Form ES-401-1		
Plant Systems - Tier 2/Group 2(SRO)														
System #	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 (Q92)								X				A2. Ability to (a) predict the impacts of the following on the CONTROL ROD DRIVE HYDRAULIC SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.13 Low cooling water flow (10CFR 55.43)	2.8	1
216000 Nuclear Boiler Instrumentation (Q93)								X				A2. Ability to (a) predict the impacts of the following on the NUCLEAR BOILER INSTRUMENTATION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.04 Detector diaphragm failure or leakage (10CFR 55.43)	3.0	1
K/A Category Point Totals:	0	0	0	0	0	0	0	2	0	0	0	Group Point Total:	2	

Facility: SUSQUEHANNADate of Exam 8/09-8/13 2004

Category	K/A#	Topic		SRO Only	
				IR	#
1. Conduct of Operations	2.1 (Q94)	2.1.10 Knowledge of conditions and limitations in the facility license.		3.9	1
	Subtotal				1
2. Equipment Control	2.2 (Q95)	2.2.17 Knowledge of the process for managing maintenance activities during power operations.		3.5	1
	2.2 (Q96)	2.2.21 Knowledge of pre and post maintenance operability requirements.		3.5	1
	Subtotal				2
3. Radiation Control	2.3 (Q97)	2.3.4 Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized.		3.1	1
	2.3 (Q98)	2.3.8 Knowledge of the process for performing a planned gaseous radioactive release.		3.2	1
	Subtotal				2
4. Emergency Procedures/ Plan	2.4 (Q99)	2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.		3.6	1
	2.4 (Q100)	2.4.3 Ability to identify post-accident instrumentation.		3.8	1
	Subtotal				2
Tier 3 Point Total					7

Tier / Group	Randomly Selected K/A	Reason for Rejection
N/A	N/A	As per letter PLA005439 PLA14-13 from Jeff Helsel (PPL) to Alan Blamey (NRC) dated Feb. 4 th 2002 all K/As that are not applicable to SSES design were suppressed. A copy of this letter and the specific K/As involved is available upon request.
1/1	2.4.28	RO Importance rating is less than 2.5
1/2	295002 AA21.03	RO Importance rating is less than 2.5
1/2	295017	High Offsite Release already addressed with 295038 in Tier 1 Group 1. For purposes of a balanced exam, another Tier 1 Group 2 system would be more appropriate.
2/2	272000 K1.15	Not applicable to SSES. Filter Building does not exist.
2/2	290001 K6.06	RO Importance rating is less than 2.5
3	2.1.26	RO Importance rating is less than 2.5
3	2.2.6	RO Importance rating is less than 2.5
3	2.2.7	RO Importance rating is less than 2.5
3	2.2.10	RO Importance rating is less than 2.5
3	2.2.11	RO Importance rating is less than 2.5
3	2.2.14	RO Importance rating is less than 2.5
3	2.2.8	RO Importance rating is less than 2.5
3	2.2.9	RO Importance rating is less than 2.5
3	2.3.6	RO Importance rating is less than 2.5
3	2.3.3	RO Importance rating is less than 2.5
3	2.3.4	GET knowledge level; knowledge of permissible levels in excess of those authorized is SRO knowledge.
All Tiers and groups except Tier 3	N/A	For the SRO only questions, only A2, AA2, EA2, and G K/As were used in the selection process. A2, AA2, EA2, and G K/As were used as these are the only K/As that have 10CFR 55.43 direct connections.
2/1	239002 Generic section 2.3 (All)	Cannot apply Generic Radiation Control topics to SRV system.
2/1	212000 A2.17	Main Steam line high radiation signal inputs to MSIV closure have been removed, Main Steam line high radiation signal will now give alarm only.
3	2.2.30	Not SRO level knowledge

2/1	216000 A2.14	Design not applicable to Susquehanna; Recirculation Flow instrumentation does not provide any control signal inputs to the Nuclear Boiler Instrumentation System.
1/2	295010 AA2.02	Too similar to 295024 2.1.32 used in question 81
2/2	239001 A1.01	This K/A is not directly applicable to Susquehanna and parallels system 241000 K/As. Susquehanna has no direct reheater controls, and reactor pressure is controlled by EHC (system 241000).
2/2	226001 A2.16	Loss of RHR cooling water flow during the containment spray mode has no affect on containment spray mode. RHR cooling water is a long-term decay heat removal issue. Therefore it is difficult to construct a question that will have an answer other than there is no affect. If there is no affect, then the second part of the K/A (based on predicted impact use procedures to mitigate) can never be evaluated since there isn't any procedural guidance to address "No affect".
2/2	290001 K6.01	Deleted to achieve exam balance. There are already several Reactor Building ventilation topics covered on this exam.
2/1	205000 A3.02	Deleted from the exam. Question was too close to the same knowledge and ability that is being tested in question # 79.

Facility: SUSQUEHANNADate of Examination: 08/09-08/13 2004Examination Level (circle one): **RO**Operating Test Number: N/A

Administrative Topic (See Note)	Describe activity to be performed
Conduct of Operations	2.1.20 4.3 NEW JPM Fill Out An Aborted Evolution Control Form.
Conduct of Operations	2.1.33 3.4 NEW JPM Perform Drywell sump calculation and determine if leakage is less than Tech. Spec LCO.
Equipment Control	2.2.12 3.0 NEW JPM Determine Jet pump operability.
Radiation Control	2.3.10 2.9 NEW JPM Determine Radiological blocking points for a planned containment entry with the plant at 10% power.
Emergency Plan	N/A

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

Facility: SUSQUEHANNADate of Examination: 08/09-08/13 2004Examination Level (circle one): SROOperating Test Number: N/A

Administrative Topic (See Note)	Describe activity to be performed
Conduct of Operations	2.1.25 3.1 NEW JPM Evaluate/Validate Seismic Monitor System Trigger (SSE leading to Alert E-plan Classification)
Conduct of Operations	2.1.33 4.0 NEW JPM Perform Drywell sump calculation and determine if leakage is less than Tech. Spec LCO.
Equipment Control	2.2.22 4.1 NEW JPM Determine Tech Spec required actions for single loop operations at 28% power AND additional Tech Spec actions to raise power under these conditions
Radiation Control	2.3.10 2.9 NEW JPM Determine Radiological blocking points for a planned containment entry with the plant at 10% power. Identify additional power restrictions/controls for the entry.
Emergency Plan	2.4.44 4.0 NEW JPM Complete ENS and PAR State notification forms (requires PAR determination).
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.	

Facility: **SUSQUEHANNA**Date of Examination: **8/09-8/13 2004**Exam Level (circle one): **RO**Operating Test No.: **N/A**

Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

System / JPM Title	Type Code*	Safety Function
202002 A2.05 3.1/3.1 64.OP.007.151 Reset the Fluid Drive Scoop Tube Lock (OP-164-001)	D, A, S	1
261000 A3.01 3.2/3.3 Perform a Manual Startup of the SGTS in Accordance With OP-070-001	N, E, A, S	9
264000 A4.04 3.7/3.7 Manually Synchronize Diesel Generator "A" to 4.16KV Bus 1A from Panel OC653 in Accordance With OP-024-001	D, E, S	6
295028 EA1.03 3.9/3.9 Reset Drywell Cooling Isolation and Restore Drywell Cooling IAW ES-134-001 (Control Room Actions)	D, E, L, S	7
295037 EA1.11 3.5/3.6 Bypass MSIV and CIG Interlocks During An ATWS And Restore CIG (OP-184-001)	D, E, A, L, S	5
259001 A2.07 3.7/3.8 Perform Switching Feedwater Level Control 45.OP.013.151 (OP-145-001)	D, A, S	2
295018 AA1.01 3.3/3.4 Respond to loss of RBCCW IAW ON-114-001	N, S	8
206000 A4.13 4.1/4.0 Recovery from a Manual Closure of HPCI Isolation Valves With an Initiation Signal Present With a Steam Leak Developing. (OP-152-001)	D, E, A, S	4

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

262002 A4.01 2.8/3.1 Place The Vital AC Uninterruptible Power Supply AC System In Service In Accordance With OP-157-001	M	6
212000 A1.01 2.8/2.9 Start RPS MG Set 1S237A from Local Control Panel 1G201A IAW OP-158-001	E M, R, A	7
201002 K1.06 3.2/3.3 Bypass Control Rod at Rod Drive Control Cabinet (RDCC) (OP-156-001)	E/A, M	1

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA, (E/A)Emergency/Abnormal, (E)SF

Facility: **SUSQUEHANNA**Date of Examination: **8/09-8/13 2004**Exam Level (circle one): **SRO-I**Operating Test No.: **N/A**

Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

System / JPM Title	Type Code*	Safety Function
202002 A2.05 3.1/3.1 64.OP.007.151 Reset the Fluid Drive Scoop Tube Lock (OP-164-001)	D, A, S	1
261000 A3.01 3.2/3.3 Perform a Manual Startup of the SGTS in Accordance With OP-070-001	N, E, A, S	9
264000 A4.04 3.7/3.7 Manually Synchronize Diesel Generator "A" to 4.16KV Bus 1A from Panel OC653 in Accordance With OP-024-001	D, E, S	6
295028 EA1.03 3.9/3.9 Reset Drywell Cooling Isolation and Restore Drywell Cooling IAW ES-134-001 (Control Room Actions)	D, E, L, S	7
295037 EA1.11 3.5/3.6 Bypass MSIV and CIG Interlocks During An ATWS And Restore CIG (OP-184-001)	D, E, A, L, S	5
295018 AA1.01 3.3/3.4 Respond to loss of RBCCW IAW ON-114-001	N, S	8
206000 A4.13 4.1/4.0 Recovery from a Manual Closure of HPCI Isolation Valves With an Initiation Signal Present With a Steam Leak Developing. (OP-152-001)	D, E, A, S	4
In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
262002 A4.01 2.8/3.1 Place The Vital AC Uninterruptible Power Supply AC System In Service In Accordance With OP-157-001	M	6
212000 A1.01 2.8/2.9 Start RPS MG Set 1S237A from Local Control Panel 1G201A IAW OP-158-001	E, M, R, A	7
201002 K1.06 3.2/3.3 Bypass Control Rod at Rod Drive Control Cabinet (RDCC) (OP-156-001)	E/A, M	1
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA, (E/A)Emergency/Abnormal, (E)SF		

Facility: **SUSQUEHANNA**Date of Examination: **8/09-8/13 2004**Exam Level (circle one): **SRO-U**Operating Test No.: **N/A****Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)**

System / JPM Title	Type Code*	Safety Function
261000 A3.01 3.2/3.3 Perform a Manual Startup of the SGTS in Accordance With OP-070-001	N, E, A, S	9
295037 EA1.11 3.5/3.6 Bypass MSIV and CIG Interlocks During An ATWS And Restore CIG (OP-184-001)	D, E, A, L, S	5

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

262002 A4.01 2.8/3.1 Place The Vital AC Uninterruptible Power Supply AC System In Service In Accordance With OP-157-001	M	6
212000 A1.01 2.8/2.9 Start RPS MG Set 1S237A from Local Control Panel 1G201A IAW OP-158-001	E M, R, A	7
201002 K1.06 3.2/3.3 Bypass Control Rod at Rod Drive Control Cabinet (RDCC) (OP-156-001)	E/A, M	1

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA, (E/A)Emergency/Abnormal, (E)SF

Facility: Susquehanna Scenario No.: ILO-301 Op-Test No.: N/A

Examiners: _____ Operators: _____

Initial Conditions: IC-15, Unit 1 at 30% power EOL, Unit 2 at 100% power EOL

Turnover: Unit 1 is at 30% power with the startup on hold for a Feedwater heater drain valve solenoid replacement. Control rod sequence B2 is currently at step 450. A small leak in the RWCU pump room is being monitored with a video monitor. The leak is on 'B' RWCU pump suction valve 144-F005B. Extraction steam is to be removed from 'C' Feedwater heater string immediately after assuming the shift to avoid spurious valve closures during replacement of relay LSHHX-10419C in panel 1C103.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Remove Extraction Steam from 'C' FWHTR String
2		I	MTLO Temperature Element Failure
3		C	Control Rod Drifts In
4		C	Loss of (Reactor Building) Zone 1 HVAC
5		C	Loss of Main Condenser Vacuum
6		C	RPS 'A' Scram Failure
7		M	RCIC Steam Line Break
8		C	RCIC Isolation Failure
9		C	RWCU Pump Room High Temperature
10		M	Rapid Depressurization
11		C	2 ADS SRVs Fail to Open

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

Facility: SusquehannaScenario No.: ILO-302Op-Test No.: N/A

Examiners: _____

Operators: _____

Initial Conditions: IC-18, Unit 1 at 80% power EOL, Unit 2 in Mode 4

Turnover: CRD pump 1B is out of service for breaker maintenance and is not expected to return this shift. Condensate pump 1B has a possible ground, requiring the crew to remove 1B Condensate pump from service for inspection. No surveillance activities are planned or due during the shift. Chemistry and Reactor Engineering are investigating a spike in Off-Gas activity during the last control rod sequence exchange.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Shutdown 1B Condensate Pump
2		C	Condensate Minimum Flow Recirc Valve Failure
3		I	'A' Narrow Range Level Instrument Fails Upscale
4		C	Fuel Clad Failure
5		I	RPS 'A' Failure to Trip/ATWS
6		C	'D' Main Steam Line Failure to Isolate
7		C	'D' Main Steam Line Leak in Turbine Building
8		M	Radioactivity Release
9		M	Rapid Depressurization

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

Facility: Susquehanna Scenario No.: ILO-401 Op-Test No.: N/A

Examiners: _____ Operators: _____

Initial Conditions: IC-17, Unit 1 at 69% power EOL, Unit 2 at 100% power EOL

Turnover: A plant startup is being conducted in accordance with GO-100-002 and is complete through step 5.74. Control rods are being withdrawn in accordance with startup sequence B2, which is currently at step 550. RCIC is tagged out for maintenance and is not expected back this shift. Unit 1 Cooling Tower lights are out of service due to a bad circuit breaker. The Standby Liquid Control air sparger is open for a Chemistry surveillance.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Drywell Unit Coolers/Fans Surveillance
2		C	Trip of Drywell Fan 1V414A
3		C	Condensate Pump 'C' Trip / RFPT 'A' Control Signal Failure
4		C	Containment Instrument Gas Leak at PT-12643
5		I	Recirc Flow Unit 'A' Fails Downscale
6		M	Outboard MSIV Closure
7		C	Two SRVs Stick Open
8		C	Bottom Head Drain Line Leak
9		C	HPCI Auto-start Failure
10		C	ADS Auto Logic Failure
11		M	Rapid Depressurization

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

Facility: Susquehanna Scenario No.: ILO-501 Op-Test No.: N/A

Examiners: _____ Operators: _____

Initial Conditions: IC-11, Unit 1 in Mode 2 at 9% power EOL, Unit 2 at 100% power EOL

Turnover: A plant startup is in progress in accordance with GO-100-002 and is complete up to step 5.49.7. Control rods are being withdrawn in accordance with startup sequence B2, which is currently at step 322. ESS bus 1A202 is selected to its alternate source to allow maintenance on the normal supply breaker. The maintenance is complete and the crew will transfer bus 1A202 to its normal power source following shift turnover. Engineering is investigating increased Off-gas flow. The Computer Group to remove PICSY from service after coordinating with the control room. I&C to perform MSL Flow surveillance SI-183-204, -205, -206 and -207 later this shift.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Transfer Bus 1A202 to Normal Source
2		I	Main Steam Tunnel Temperature Detector Failure
3		C	Reactor Feed Pump 'A' High Bearing Temperature
4		I	IRM 'G' Fails Upscale
5		I	IRM Division I Bypass Failure
6		C	Loss of Offsite Power
7		M	Loss of Coolant Accident
8		C	1 Control Rod Fails to Insert
9		I	'B' RHR Pump Auto Logic Failure
10		C	'B' Core Spray Pump Trip
11		I	Breaker 1A20404 Auto Logic Failure
12		M	Rapid Depressurization
13		M	RPV Flooding

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

Facility: Susquehanna Scenario No.: ILO-601 Op-Test No.: N/A

Examiners: _____ Operators: _____

Initial Conditions: IC-20, Unit 1 at 90% power EOL, Unit 2 at 100% power EOL

Turnover: 1B EHC pump is out of service for breaker maintenance and will not be returned to service this shift. RHR Loop 'A' has just been secured from Suppression Pool Cooling and 1A RHRSW pump is running for vibration data, which is complete. The crew will shutdown RHRSW following shift turnover. ESW pumps 'A' and 'B' are in service to support Suppression Pool Cooling operation. Chemistry and RX Engineering are investigating a spike in Off-Gas activity during the last control rod sequence exchange.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Secure 1A RHRSW Pump
2		I	RHRSW Radiation Monitor Fails Upscale
3		C	Loss of Stator Cooling
4		R	Power Reduction
5		C	Generator Lockout / Turbine Trip
6		M	RPS 'B' Failure to Trip /ARI Failure / ATWS
7		C	SLC System Squib Valves Fail
8		C	1A EHC Pump Trip

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