

SUSQUEHANNA 8/11 EXAM OUTLINE COMMENTS

Comments provided per telecom to licensee Rich Brooks on 5/29/03.

Admin

All but one JPM item is new (A.1.2 SRO JPM - bank item). Discussed actual content of each JPM task

- RO Admin JPM A.1.2 - JPM involves a failed power supply, must locate proper procedure and perform a calculation - seemed like a reasonable task.
- RO Admin JPM A.1.2 - Make sure the correct answer can not be determined through simple deductive reasoning without applying detailed license specific type knowledge. For example, if it can easily be determined that based on the operable LPRM strings provided and the use of the form that the answer isn't easily determined - no plant specific knowledge required.
- RO Admin JPM A.3 - Have applicants develop blocking and tagging clearance for a safety significant component - provide necessary forms and tell them computer is down.
- SRO Admin JPM A.3 - Do not provide LCO sheet for failed RM as planned this is too leading. Rather include this as one of the conditions in the initial conditions provided along with some other non-pertinent information so applicant has to determine that the failed RM is a TS LCO condition and will preclude authorization to de-inert and purge DW.
- SRO Admin JPM A.4 - Add notification to classification as originally discussed. This will be done as a follow-up JPM to the dynamic simulator portion of the exam.

JPMs

- JPM outline for both the RO and SRO do not meet NUREG 1021 in that for JPMs performed in simulator i.e., the licensee has proposed that two safety functions are repeated - there are two safety function #1s and two safety function #2s.
- Cautioned licensee that the following JPMs Maximize CRD, Respond to a stuck open SRV, Perform switching Feed Water Level Control, and Initiate Containment Spary may be too similar to the tasks that will be performed in the scenario (see ES301, D.1.h, D.3.b, and D.4.c).

Scenario Outlines

- Critical tasks are not identified so couldn't comment but discussed expectations.

- Scenario #PC017-104 is 50% power - told licensee we are considering less than 30% as our standard for low power.

RO Written

- Q#13, #15, and #23 may be testing the same areas - too close.
- Q#21, and #45 may be testing the same areas - too close.
- Q#24 looks like potentially over simplistic.
- In general, a lot of electrical supply type questions - ensure not all simple power supplies but some questions at least should involve higher cognitive level.
- Q#34 may be already testing on Part C Sim exam.
- Q#27 may be better tested on Part C Sim exam.
- Q#74 - knowledge of alarm response- already tested and better tested on Part C Sim exam.

SRO Written

- Q#77, and Q#89 may be just system knowledge not SRO only - depends on how questions are written?
- Q#81, 82, 85, 87, 100 - may be RO level e.g., required immediate actions on an abnormal procedure required knowledge for RO - depends on how questions are written?

Susquehanna Learning Center

769 Salem Boulevard
Berwick, PA 18603-0467
570-542-3353



May 14, 2003

Mr. John Caruso
USNRC Chief Examiner
USNRC Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Susquehanna Learning Center
Examination Outlines
PLA 005628 File A14-13D

Dear Mr. Caruso:

Enclosed for your review and approval are the outlines for the PPL Susquehanna, LLC Initial Licensed Operator Examination scheduled to begin Monday, August 11, 2003. These outlines are submitted in accordance with NUREG 1021, "Operator Licensing Examination Standards for Power Reactors" (Draft Revision 9). The following materials are enclosed:

- Form ES-201-2, Examination Outline Quality Checklist - Rev. 0 (Signed)
- Form ES-201-3, Examination Security Agreement (Copy)
- Form ES-301-1, Administrative Topics Outline RO - Rev. 0
- Form ES-301-1, Administrative Topics Outline SRO - Rev. 0
- Form ES-301-2, Control Room/In-Plant Systems Outline RO - Rev. 0
- Form ES-301-2, Control Room/In-Plant Systems Outline SRO-I - Rev. 0
- Form ES-301-2 Control Room/In-Plant Systems Outline SRO-U - Rev. 0
- Form ES-301-4, Simulator Scenario Quality Checklist - Rev. 0 (Unsigned)
- **RO Written Outline**
 - Form ES-401-1, BWR Examination Outline - RO - Rev. 0 (9 Pages)
 - Form ES-401-3, Generic Knowledge and Abilities Outline Tier 3-RO - Rev. 0 (1 Page)
- **SRO Written Outline**
 - Form ES-401-1, BWR Examination Outline - SRO - Rev. 0 (5 Pages)
 - Form ES-401-3, Generic Knowledge and Abilities Outline Tier 3-SRO - Rev. 0 (1 Page)
- Form ES-401-4, Record of Rejected K/As - Rev. 0
- Form ES-D-1, Scenario Outline - Rev. 0 (3 - All New)

The unsigned Form ES-301-4, Simulator Scenario Quality Checklist, is being sent to support Form ES-201-2, Examination Outline Quality Checklist. A signed version of this form will be sent with the exam materials submittal.

The Written Exam Outline was compiled using the Random Selection Process described in ES-401 Attachment 1, Example Systematic Sampling Methodology and the K/A Elimination Guidance provided in ES-401 Attachment 2, K/A Elimination Guidance. Rejected K/As were documented on Form ES-401-4, Record of Rejected K/As.

The expected additions to the Exam Security Agreement are the Operation's Validation Team.

We request these materials be withheld from public disclosure until after the completion of the exam. If you have any questions, please feel free to contact me at 570-542-3326 or Rich Brooks at 570-542-1891.

Sincerely,



Kenneth M. Roush
Manager-Nuclear Training

Response: No

Enclosures: Listed

cc: B. R. Stitt
Ops Letter File
Nuc Records-Site

rb for kr - exam outlines - pla 005628

RB/KMR/vah

Facility: **SUSQUEHANNA**Date of Exam **8/11-8/15 2003**

Tier	Group	RO K/A Category Points												SRO-ONLY Points				
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	TOTAL	K	A	A	G	TOTAL
1. Emergency & Abnormal Plant Evolutions	1	2	2	3				5	4			4	20					8
	2	2	0	1				2	2			0	7					4
	Tier Totals	4	2	4				7	6			4	27					12
2. Plant Systems	1	2	3	3	3	1	2	2	2	3	2	3	26					4
	2	0	1	1	1	1	1	3	1	2	1	0	12					2
	Tier Totals	2	4	4	4	2	3	5	3	5	3	3	38					6
3. Generic Knowledge and Abilities Categories						1		2		3		4	10	1	2	3	4	
						3		3		2		2						7

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.

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 Q.1				X			AA1 Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: AA1.05 Recirculation flow control system	3.3	1
295003 Partial or Complete Loss of AC / 6 Q.2		X					AK2 Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF A.C. POWER and the following: AK2.02 Emergency generators	4.1	1
295004 Partial or Total Loss of DC Pwr / 6 Q.3	X						AK1 Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : AK1.03 Electrical bus divisional separation	2.9	1
295005 Main Turbine Generator Trip / Q.4					X		AA2 Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP : AA2.03 Turbine valve position	3.1	1
295006 SCRAM / 1 Q.5				X			AA1 Ability to operate and/or monitor the following as they apply to SCRAM : AA1.06 CRD hydraulic system	3.5	1
295016 Control Room Abandonment / 7 Q.6			X				AK3 Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT : AK3.03 Disabling control room controls	3.5	1
295018 Partial or Total Loss of CCW / 8 Q.7						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.0	1
295019 Partial or Total Loss of Inst. Air / 8 Q.8						X	2.4.46 Ability to verify that the alarms are consistent with the plant conditions.	3.5	1
295021 Loss of Shutdown Cooling / 4 Q.9			X				AK3 Knowledge of the reasons for the following responses as they apply to LOSS OF SHUTDOWN COOLING : AK3.05 Establishing alternate heat removal flow paths	3.6	1
295023 Refueling Accidents Cooling Mode / 8 Q.10				X			AA1. Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS : AA1.07 Standby gas treatment/FRVS	3.6	1
295024 High Drywell Pressure / 5 Q.11					X		EA2. Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE: EA2.04 Suppression chamber pressure: Plant-Specific	3.9	1
295025 High Reactor Pressure / 3 Q.12						X	2.4.18 Knowledge of the specific bases for EOPs.	2.7	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	#
295026 Suppression Pool High Water Temp. / 5 Q.13					X		EA2 Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: EA2.02 Suppression pool level	3.8	1
295028 High Drywell Temperature / 5 Q.14				X			EA1 Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE : EA1.01 Drywell spray: Mark-I & II	3.8	1
295030 Low Suppression Pool Water Level / 5 Q.15					X		EA2 Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL : EA2.02 Suppression pool temperature	3.9	1
295031 Reactor Low Water Level / 2 Q.16	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
295031 Reactor Low Water Level / 2 Q.17				X			EA1 Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL : EA1.10 Control rod drive	3.6	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Jnknown / 1 Q.18		X					EK2 Knowledge of the interrelations between SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN and the following: EK2.09 Reactor water level	4.0	1
295038 High Off-site Release Rate / 9 Q.19			X				EK3. Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: EK3.02 System isolations	3.9	1
600000 Plant Fire On Site / 8 Q.20						X	2.1.31 Ability to locate control room switches / controls and indications and to determine that they are correctly reflecting the desired plant lineup.	4.2	1
K/A Category Totals:	2	2	3	5	4	4	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	#
295008 High Reactor Water Level / 2 Q.21	X						AK1 Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR WATER LEVEL : AK1.03 Feed flow/steam flow mismatch	3.2	1
295009 Low Reactor Water Level / 2 Q.22				X			AA1 Ability to operate and/or monitor the following as they apply to LOW REACTOR WATER LEVEL : AA1.02 Reactor water level control	4.0	1
295013 High Suppression Pool Temp. / 5 Q.23				X			AA1 Ability to operate and/or monitor the following as they apply to HIGH SUPPRESSION POOL TEMPERATURE : AA1.01 Suppression pool cooling	3.9	1
295015 Incomplete SCRAM / 1 Q.24					X		AA2 Ability to determine and/or interpret the following as they apply to INCOMPLETE SCRAM : AA2.02 Control rod position	4.1	1
295017 High Off-site Release Rate / 9 Q.25	X						AK1 Knowledge of the operational implications of the following concepts as they apply to HIGH OFF-SITE RELEASE RATE : AK1.02 Protection of the general public	3.8	1
295020 Inadvertent Cont. Isolation / 5 & 7 Q.26			X				AK3 Knowledge of the reasons for the following responses as they apply to INADVERTENT CONTAINMENT ISOLATION: AK3.06 Suppression pool water level response	3.3	1
295022 Loss of CRD Pumps / 1 Q.27					X		AA2 Ability to determine and/or interpret the following as they apply to LOSS OF CRD PUMPS : AA2.03 CRD mechanism temperatures	3.1	1
K/A Category Point Totals:	2	0	1	2	2	0	Group Point Total:		7

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 Q.28				X								K4. Knowledge of RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) design feature(s) and/or interlocks which provide for the following: K4.06 Adequate pump net positive suction head (interlock suction valve open): Plant-Specific	3.5	1
203000 RHR/LPCI: Injection Mode Q.29											X	2.2.22 Knowledge of limiting conditions for operations and safety limits.	3.4	1
205000 Shutdown Cooling Q.30									X			A3. Ability to monitor automatic operations of the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) including: A3.02 Pump trips	3.2	1
206000 HPCI Q.31											X	2.4.10 Knowledge of annunciator response procedures.	3.0	1
209001 LPCS Q.32		X										K2. Knowledge of electrical power supplies to the following: K2.03 Initiation logic	2.9	1
209001 LPCS Q.33			X									K3. 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	1
211000 SLC Q.34											X	A4. Ability to manually operate and/or monitor in the control room: A4.08 System initiation: Plant-Specific	4.2	1
211000 SLC Q.35											X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation.	3.7	1
212000 RPS Q.36	X											K1. Knowledge of the physical connections and/or cause/effect relationships between REACTOR PROTECTION SYSTEM and the following: K1.06 Control rod drive hydraulic system	3.5	1
212000 RPS Q.37		X										K2. Knowledge of electrical power supplies to the following: K2.01 RPS motor-generator sets	3.2	1
215003 IRM Q.38									X			A3. Ability to monitor automatic operations of the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM including: A3.03 RPS status	3.7	1
215004 Source Range Monitor Q.39					X							K5. Knowledge of the operational implications of the following concepts as they apply to SOURCE RANGE MONITOR (SRM) SYSTEM : K5.01 Detector operation	2.6	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 Q.40						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM : K6.07 Flow converter/comparator network: Plant-Specific	3.2	1
217000 RCIC Q.41		X										K2. Knowledge of electrical power supplies to the following: K2.02 RCIC initiation signals (logic)	2.8	1
218000 ADS Q.42						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the AUTOMATIC DEPRESSURIZATION SYSTEM : K6.03 Nuclear boiler instrument system (level indication)	3.8	1
223002 PCIS/Nuclear Steam Supply Shutoff Q.43				X								K4. Knowledge of PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF design feature(s) and/or interlocks which provide for the following: K4.03 Manual initiation capability: Plant-Specific	3.5	1
239002 SRVs Q.44							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the RELIEF/SAFETY VALVES controls including: A1.06 Reactor power	3.7	1
259002 Reactor Water Level Control Q.45								X				A2. Ability to (a) predict the impacts of the following on the REACTOR WATER LEVEL CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.01 Loss of any number of main steam flow inputs	3.3	1
261000 SGTS Q.46	X											K1. Knowledge of the physical connections and/or cause/effect relationships between STANDBY GAS TREATMENT SYSTEM and the following: K1.11 Primary containment pressure	3.2	1
262001 AC Electrical Distribution Q.47			X									K3. Knowledge of the effect that a loss or malfunction of the A.C. ELECTRICAL DISTRIBUTION will have on following: K3.05 Off-site power system	3.2	1
262002 UPS (AC/DC) Q.48				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

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	#
263000 DC Electrical Distribution Q.49								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: A2.01 Grounds	2.8	1
263000 DC Electrical Distribution Q.50									X			A3. Ability to monitor automatic operations of the D.C. ELECTRICAL DISTRIBUTION including: A3.01 Meters, dials, recorders, alarms, and indicating lights	3.2	1
264000 EDGs Q.51							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the EMERGENCY GENERATORS (DIESEL/JET) controls including: A1.09 Maintaining minimum load on emergency generator (to prevent reverse power)	3.0	1
300000 Instrument Air Q.52			X									K3. Knowledge of the effect that a loss or malfunction of the (INSTRUMENT AIR SYSTEM) will have on the following: K3.01 Containment air system	2.7	1
400000 Component Cooling Water Q.53										X		A4. Ability to manually operate and / or monitor in the control room: A4.01 CCW indications and control	3.1	1
K/A Category Point Totals:	2	3	3	3	1	2	2	2	3	2	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 Q.54						X						K6. Knowledge of the effect that a loss or malfunction of the following will have on the CONTROL ROD DRIVE HYDRAULIC System : K6.05 A.C. power	3.3	1
201003 Control Rod and Drive Mechanism Q.55							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the CONTROL ROD AND DRIVE MECHANISM controls including: A1.03 CRD drive water flow	2.9	1
201004 RSCS Q.56					X							K5. Knowledge of the operational implications of the following concepts as they apply to ROD SEQUENCE: K5.01 Prevention of clad damage if a control rod drop accident (CRDA) occurs: BWR-4,5	3.6	1
201006 RWM Q.57							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the ROD WORTH MINIMIZER SYSTEM (RWM) (PLANT SPECIFIC) controls including: A1.01 Rod position: P-Spec(Not-BWR6)	3.2	1
202001 Recirculation Q.58		X										K2. Knowledge of electrical power supplies to the following: K2.03 Recirculation system valves	2.7	1
215002 RBM Q.59									X			A3. Ability to monitor automatic operations of the ROD BLOCK MONITOR SYSTEM including: A3.03 Alarm and indicating lights: BWR-3,4,5	3.1	1
216000 Nuclear Boiler Instrumentation Q.60				X								K4. Knowledge of NUCLEAR BOILER INSTRUMENTATION design feature(s) and/or interlocks which provide for the following: K4.09 Protection against filling the main steam lines from the feed system	3.3	1
219000 RHR/LPCI: Torus/Pool Cooling Mode Q.61							X					A1. Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE controls including: A1.02 System flow	3.5	1
256000 Reactor Condensate Q.62								X				A2. 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: A2.12 Loss of equipment component cooling water systems	3.1	1
272000 Radiation Monitoring Q.63									X			A3. Ability to monitor automatic operations of the RADIATION MONITORING SYSTEM including: A3.06 Ventilation system isolation indications	3.4	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	#
288000 Plant Ventilation Q.64			X									K3. Knowledge of the effect that a loss or malfunction of the PLANT VENTILATION SYSTEMS will have on following: K3.02 Reactor building temperature: Plant-Specific	2.9	1
290001 Secondary CTMT Q.65										X		A4. Ability to manually operate and/or monitor in the control room: A4.11 System reset: Plant-Specific	3.4	1
K/A Category Point Totals:	0	1	1	1	1	1	3	1	2	1	0	Group Point Total:		12

Facility SUSQUEHANNADate of Exam 8/11-8/15 2003

Category	K/A#	Topic	RO		SRO Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.2 Q.66	Knowledge of operator responsibilities during all modes of plant operation.	3.0	1		
	2.1.23 Q.67	Ability to perform specific system and integrated plant procedures during different modes of plant operation.	3.9	1		
	2.1.7 Q.68	Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation.	3.7	1		
	Subtotal			3		
2. Equipment Control	2.2.22 Q.69	Knowledge of limiting conditions for operations and safety limits.	3.4	1		
	2.2.11 Q.70	Knowledge of the process for controlling temporary changes.	2.5	1		
	2.2.26 Q.71	Knowledge of refueling administrative requirements.	2.5	1		
	Subtotal			3		
3. Radiation Control	2.3.1 Q.72	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	2.6	1		
	2.3.9 Q.73	Knowledge of the process for performing a containment purge.	2.5	1		
	Subtotal			2		
4. Emergency Procedures/ Plan	2.4.10 Q.74	Knowledge of annunciator response procedures.	3.0	1		
	2.4.9 Q.75	Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.	3.3	1		
	Subtotal			2		
Tier 3 Point Total				10		7

Facility: **SUSQUEHANNA**Date of Exam **8/11-8/15 2003**

Tier	Group	RO K/A Category Points										SRO-ONLY Points				
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	K	A	A2	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	1	3	0	4
	2											0	1	0	1	2
	Tier Totals											0	2	3	1	6
3. Generic Knowledge and Abilities Categories												1	2	3	4	7
												2	2	1	2	

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.

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 Q. 76					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 (10CFR 55.43)	3.2	1
295019 Partial or Total Loss of Inst. Air / 8 Q. 77					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
295023 Refueling Accidents Cooling Mode / 8 Q. 78					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 Q. 79					X		EA2. Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE: EA2.02 Drywell temperature (10CFR 55.43)	4.0	1
295025 High Reactor Pressure / 3 Q. 80						X	2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation. *SRO LEVEL OBJECTIVE	4.0	1
295026 Suppression Pool High Water Temp. / 5 Q. 81						X	2.4.11 Knowledge of abnormal condition procedures. (10CFR 55.43)	3.6	1
295028 High Drywell Temperature / 5 Q. 82					X		EA2. Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE : EA2.03 Reactor water level (10CFR 55.43)	3.9	1
295031 Reactor Low Water Level / 2 Q. 83						X	2.4.22 Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations. (10CFR 55.43)	4.0	1
K/A Category Totals:	0	0	0	0	5	3	Group Point Total:		8

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 Vacuum / 3 Q. 84					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 (10CFR 55.43)	3.3	1
295014 Inadvertent Reactivity Addition / 1 Q. 85					X		AA2. Ability to determine and/or interpret the following as they apply to INADVERTENT REACTIVITY ADDITION : AA2.01 Reactor power (10CFR 55.43)	4.2	1
295015 Incomplete SCRAM / 1 Q. 86						X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation. (10CFR 55.43)	4.4	1
295022 Loss of CRD Pumps / 1 Q. 87					X		AA2. Ability to determine and/or interpret the following as they apply to LOSS OF CRD PUMPS : AA2.01 Accumulator pressure (10CFR 55.43)	3.6	1
K/A Category Point Totals:	0	0	0	0	3	1	Group Point Total:		4

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	#
203000 RHR/LPCI: Injection Mode Q. 88								X				A2. Ability to (a) predict the impacts of the following on the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.06 Emergency generator failure (10CFR 55.43)	3.9	1
205000 Shutdown Cooling Q. 89									X			A3. Ability to monitor automatic operations of the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) including: A3.02 Pump trips *SRO LEVEL OBJECTIVE	3.2	1
209001 LPCS Q. 90								X				A2. Ability to (a) predict the impacts of the following on the LOW PRESSURE CORE SPRAY SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.05 Core spray line break (10CFR 55.43)	3.6	1
264000 EDGs Q. 91								X				A2. Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS (DIESEL/JET) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.09 Loss of A.C. power (10CFR 55.43)	4.1	1
K/A Category Point Totals:	0	0	0	0	0	0	0	3	1	0	0	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	#	
219000 RHR/LPCI: Torus/Pool Cooling Mode Q. 92											X	2.2.24 Ability to analyze the affect of maintenance activities on LCO status. (10CFR 55.43)	3.8	1	
234000 Fuel Handling Equipment Q. 93									X			A3. Ability to monitor automatic operations of the FUEL HANDLING EQUIPMENT including: A3.02 †Interlock operation (10CFR 55.43)	3.7	1	
K/A Category Point Totals:	0	0	0	0	0	0	0	0	1	0	1	Group Point Total:		2	

ES 401		Generic Knowledge and Abilities Outline Tier 3		Form ES-401-3	
Facility SUSQUEHANNA		Date of Exam 8/11-8/15 2003			
Category	K/A#	Topic	SRO Only		
			IR	#	
1. Conduct of Operations	2.1.20 Q. 94	Ability to execute procedure steps. (10CFR 55.43)	4.2	1	
	2.1.11 Q. 95	Knowledge of less than one hour technical specification action statements for systems. (10CFR 55.43)	3.8	1	
	Subtotal			2	
2. Equipment Control	2.2.8 Q. 96	Knowledge of the process for determining if the proposed change / test / or experiment involves an unreviewed safety question. (10CFR 55.43)	3.3	1	
	2.2.25 Q. 97	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. (10CFR 55.43)	3.7	1	
	Subtotal			2	
3. Radiation Control	2.3.10 Q. 98	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. (10CFR 55.43)	3.3	1	
	Subtotal			1	
4. Emergency Procedures/Plan	2.4.30 Q. 99	Knowledge of which events related to system operations/status should be reported to outside agencies. (10CFR 55.43)	3.6	1	
	2.4.49 Q. 100	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (10CFR 55.43)	4.0	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. Use of these previously approved suppressions was discussed with John Caruso (NRC) prior to development of the outline. A copy of the letter and the specific K/As involved is available upon request.
1/1	295023 AK3.04	No longer applicable-Only applies to initial fuel loading
2/1	209001 K3.05	RO K/A value is less than 2.5
2/1	259002 K2.01	RO K/A value is less than 2.5
2/1	262002 A4.01	Cannot write a discriminatory question on this K/A. The only available control room indication is a single common trouble alarm.
3	2.1.29	Low discriminatory value
3	2.1.22	Low discriminatory value
3	2.1.34	RO K/A value is less than 2.5
3	2.1.26	RO K/A value is less than 2.5
3	2.1.13	RO K/A value is less than 2.5
3	2.2.29	RO K/A value is less than 2.5
3	2.2.16	RO K/A value is less than 2.5
3	2.2.6	RO K/A value is less than 2.5
3	2.3.3	RO K/A value is less than 2.5
3	2.3.7	RO K/A value is less than 2.5
3	2.4.28	RO K/A value is less than 2.5
3	2.4.36	RO K/A value is less than 2.5
3	2.4.33	RO K/A value is less than 2.5
1/1	295026 2.2.3	SRO No design differences
1/2	295002 AA2.03	SRO K/A value is less than 2.5
1/1	295023 AA1.02	SRO tie to 10CFR 55.43 does not exist
1/1	295024 EK1.01	SRO tie to 10CFR 55.43 does not exist
1/1	295028 EK1.01	SRO tie to 10CFR 55.43 does not exist
1/2	295015 AK2.07	SRO tie to 10CFR 55.43 does not exist
2/1	264000 K6.09	SRO tie to 10CFR 55.43 does not exist

Facility: SSSDate of Examination: 08/11/03Examination Level (circle one): **RO**

Operating Test Number: _____

Administrative Topic (See Note)	Describe activity to be performed
Conduct of Operations	2.1.25 2.8/3.1 JPM Determine Primary Containment Water Level During Anomaly.
Conduct of Operations	2.1.7 3.7/4.4 JPM Document a failed LPRM and determine appropriate compensatory actions.
Equipment Control	2.2.13 3.6/3.8 JPM Determine accuracy and adequacy of a clearance order.
Radiation Control	N/A
Emergency Plan	2.4.27 3.0/3.5 JPM Activate the Fire Brigade and select the appropriate Pre-Fire Plan
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: SSESDate of Examination: 08/11/03Examination Level (circle one): **SRO**

Operating Test Number: _____

Administrative Topic (See Note)	Describe activity to be performed
Conduct of Operations	2.1.25 2.8/3.1 JPM Determine Primary Containment Water Level During Anomaly.
Conduct of Operations	2.1.23 3.9/4.0 JPM Authorize Bypassing Rod Worth Minimizer IAW NDAP-QA-0388
Equipment Control	2.2.13 3.6/3.8 JPM Determine accuracy and adequacy of a clearance order.
Radiation Control	2.3.9 2.5/3.4 JPM Authorize De-inerting and Purging the Drywell and Suppression Chamber with Air.
Emergency Plan	2.4.41 2.3/4.1 JPM Determine Emergency Plan EAL Classification.

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: 8/11-8/15 2003Exam Level (circle one): **RO**

Operating Test No.: _____

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

System / JPM Title	Type Code*	Safety Function
a. 215005 A2.02 3.6/3.7 Bypass an APRM Channel Trip Input	D, S	7
b. 259001 A2.07 3.7/3.8 Perform Switching Feedwater Level Control IAW OP-145-001	D, A, S	2
c. 201001 A2.06 2.9/2.9 Maximize CRD Flow IAW OP-155-001	M, A, S	1
d. 272000 A1.01 3.2/3.2 Transfer Containment Radiation Monitor Sample Pumps IAW OP-179-003	N, S	9
e. 239002 A2.03 4.1/4.2 Respond to Stuck open SRV IAW ON-183-001	M, A, S, L, E/A, E	3
f. 202001 A2.10 3.5/3.9 Respond To A Reactor Recirc Pump Dual Seal Failure IAW ON-164-003	D, S, E/A, L	1
g. 226001 A4.01 3.5/3.4 Initiate Containment Spray	M, A, S, E	5
h. 209001 A2.01 3.8/3.7 Perform Manual S/U of Core Spray IAW OP-151-001	D, A, S, E/A, E	2

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

i. 262001 K4.04 2.8/3.1 Perform Monthly Surveillance of 4KV Bus Undervoltage Relays	N, R, A	6
j. 271001 A4.09 3.6/3.6 Bypass RCIC Temp or Differential Temperature Isolation signal IAW ES-150-001	D, E/A, C	4
k. 286000 K4.05 3.7/3.8 Cross-tie Fire Protection to RHRSW	D, E/A	8

* 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: SusquehannaDate of Examination: 8/11-8/15 2003Exam Level (circle one): **SRO-I**

Operating Test No.: _____

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

System / JPM Title	Type Code*	Safety Function
a. 215005 A2.02 3.6/3.7 Bypass an APRM Channel Trip Input	D, S	7
b. 259001 A2.07 3.7/3.8 Perform Switching Feedwater Level Control IAW OP-145-001	D, A, S	2
c. 201001 A2.06 2.9/2.9 Maximize CRD Flow IAW OP-155-001	M, A, S	1
d. 272000 A1.01 3.2/3.2 Transfer Containment Radiation Monitor Sample Pumps IAW OP-179-003	N, S	9
e. 239002 A2.03 4.1/4.2 Respond to Stuck open SRV IAW ON-183-001	M, A, S, L, E/A, E	3
f. 202001 A2.10 3.5/3.9 Respond To A Reactor Recirc Pump Dual Seal Failure IAW ON-164-003	D, S, E/A, L	1
g. 226001 A4.01 3.5/3.4 Initiate Containment Spray	M, A, S, E	5

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

i. 262001 K4.04 2.8/3.1 Perform Monthly Surveillance of 4KV Bus Undervoltage Relays	N, R, A	6
j. 271001 A4.09 3.6/3.6 Bypass RCIC Temp or Differential Temperature Isolation signal IAW ES-150-001	D, E/A, C	4
k. 286000 K4.05 3.7/3.8 Cross-tie Fire Protection to RHRSW	D, E/A	8

* 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: SusquehannaDate of Examination: 8/11-8/15 2003Exam Level (circle one): **SRO-U**

Operating Test No.: _____

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

System / JPM Title	Type Code*	Safety Function
a. 239002 A2.03 4.1/4.2 Respond to Stuck open SRV IAW ON-183-001	M, A, S, L, E/A, E	3
b. 202001 A2.10 3.5/3.9 Respond To A Reactor Recirc Pump Dual Seal Failure IAW ON-164-003	D, S, E/A, L	1
c. 226001 A4.01 3.5/3.4 Initiate Containment Spray	M, A, S, E	5

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

i. 262001 K4.04 2.8/3.1 Perform Monthly Surveillance of 4KV Bus Undervoltage Relays	N, R, A	6
j. 271001 A4.09 3.6/3.6 Bypass RCIC Temp or Differential Temperature Isolation signal IAW ES-150-001	D, E/A, C	4

* 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: **SSES** Scenario No.: **PCO17-102** Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: **IC-20 Both Units at 100% Power EOL**

Turnover: **'B' Service Air Compressor out of service for preventative maintenance. The compressor will not be returned to service this shift. Decrease power to 90% for rod adjustments IAW OP-AD-338 (Attachment C) then call Reactor Engineering. Prior to starting power reduction perform SO-155-006, QUARTERLY ARI MANUAL TRIP CHANNEL FUNCTIONAL TEST.**

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N	Perform ARI surveillance
2	N/A	R	10% Power reduction to 90%
3	IMF RL02:E411K17	I	HPCI CST low level switch failure
4	IMF AV04:TV11016B 0	I	"B" Recirc pump MG set HYD FLUID CTRL TCV (TIC-11016B) failed closed. "B" Reactor Recirc Pump trip (Auto trips at 210°F as a result of TIC-11016B failure).
5	IMF TC193016 130	M	TURBINE EHC PRESSURE/FLOW GAIN UNIT FAILURE (130%) - MSIV Closure
6	IMF RD155017 bat RPB.HYDATWS-1	M	Hydraulic ATWS
7	IMF SL153001A IMF SL153001B	C	SBLC Squib valves fail to fire.
8	IMF MV06:HV155F006	C	HPCI injection Auto Open failure

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

Facility: **SSES** Scenario No.: **PCO17-103** Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: **IC-18 Unit 1 100% Power EOL. Unit 2 start-up in progress, ~ 1 hour from synchronizing to the grid.**

Turnover: **HPCI is out of service for repairs due to a governor control-oil leak. The system will not be returned to service this shift. Mechanical vacuum pump is out of service for a seal replacement. The system will not be returned to service this shift. Perform SO-054-A03, QUARTERLY ESW FLOW VERIFICATION LOOP A. Maintenance is standing by for vibration data.**

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N	Perform "A" ESW Loop Surveillance
2	IMF PM03:0P504A	C	"A" ESW pump trips during surveillance
3	IMF DS104001A (NONE 10 0)	C	Loss of "1A" ESS bus/Loss of RPS/Loss of CRD
4	IMF MV07:HV144F100 100	C	RWCU F100 VLV FAILED-OPEN
5	IMF RD1550043823 (NONE 0 20) 5	R	Rod 38-23 drifts to position 38
6	IMF CU161007 100 4:00 IMF MV07:HV144F106 (102) 100 IMF MV09:HV144F001 (004) 98	M	Unisolable break on RWCU line inside Secondary Containment
7	IMF RC150011 IMF BR05:1A10104 (204)	M	Loss of all High pressure feed. (Leads to loss of adequate core cooling, requiring rapid depressurization)

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

Facility: **SSES** Scenario No.: **PC017-104** Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: **IC-16 Unit 1 50% Power EOL. Unit 2 100% power EOL**

Turnover **B2 Start-up Sequence was suspended at step 539. Power ascension was suspended while BOP equipment is placed into service. Place 'C' RFP in service IAW GO-100-102 step 6.71.3 then continue rod withdrawal to 75% reactor power.**

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N	Place C Reactor Feed Pump in service.
2	N/A	R	Raise reactor power (power increase enough to cause stuck rod indications for event 3 below)
3	IMF RD1550063407 12 0 12	C	Stuck Rod (34-07)
4	bat FWB.PC017-104A	I	Loss of extraction steam to 3B feedwater heater (HTR 3B LEVEL CONTROL FAILURE)
5	MRF DC102140 OPEN	C	Dual Reactor Recirc Pump Trip
6	bat FWB.CPTRIP	C	Loss of all condensate pumps
7	bat RRB.PC017-104B	M	Instrument line Ref Leg Break & Bottom Head Leak inside the Drywell
8	IMF RL01:E411K2	C	HPCI Auto Start Failure
9	IMF RH149004A (4B) 20 4:00	C	RHR Suction line leak

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