Summary of Operating Exam Changes

Tab	Form	Explanation of Change
1	ES-301-2 (SRO & RO)	Replaced item k. with Cross-tie RBCCW
2	ES-D-1 (Scenario 1)	Changed Event #2 to CRD Flow Controller Failure – downscale
	ES-D-2 (Scenario 1, Event 2)	Revised expected actions based on change of event
3	ES-D-1 (Scenario 2)	Removed Main Steam Line Rad Monitor failure (Event 3) and reordered events to minimize loss of "beans" if reactor was scrammed too early in the scenario.
	ES-D-2 (Scenario 2, All)	Rearranged events 1-5, and removed event 3, so all events were renumbered
4	JPM 2	Removed steps 17-25
5	JPM 6	Removed steps 2 –16, changed cue on (new) step # 9 (previously step 24) to report amps on all phases, not just 'B'.
6	JPM 7	Added steps to gain additional Critical Step for total of 3, changed initial conditions to be 60% vice 100% to allow running in conjunction with JPM # 5
7	JPM 11	Replacement JPM since original JPM was used on audit exam
8	JPM 12	Made steps 3 & 4 Critical Steps, and changed cue at end of JPM directing to continue on JPM # 8
9	JPM 13	Made steps 3, 5, & 9 not critical
10	JPM 15	Revised Initiating Cue and Standard for Performance Step 2

Summary of Written Exam Changes

Question Number	Explanation of Change
3	Added "*psig*" to the first sentence
4	Changed "*Give*" to "*Given*" (typo)
5	Replaced items c. & d. to remove implausibility of d.
8	Rephrased question by adding "*the operator to resume*" and removing "*to be resumed*"
9	Changed "*750 gallons*" to "*780 gallons*"
11	**Not changed**, since the actions being asked about are only performed if the Subsequent Actions are not complete. Refer to pg. 6 of 2.4.143 (included in original submission)
12	Added "*if at all*"
14	Added "*if any*"
15	Added status of 'B' ADS Keylock Switch to question root and changed *–46*" to *–48*"
16	Changed "*Site Vice President*" to "*General Manager Plant Operations*"
18	Changed "*fails downscale*" to "*fails to zero D/P*".
23	Changed item d. to "*Inboard MSIVs will be closed*" for symmetry.
24	Changed "*is*" to "*in*" on item b. (typo)
32	Replaced item b. with "*maintain ventilation in isolated condition until you can restore and maintain reactor water level > +12".*"
34	Replaced with new question
39	Changed all distracters to remove full scram from the choices, since full scram = 2 half scrams.
46	Replaced with new question
47	Added procedure number and name
62	Replaced with new question
71	Rephrased question by placing the SLC pumps OOS instead of the entire system. Changed item a. since adding SLC to Condensate Storage Tank was deemed implausible. Changed item b. for symmetry.
80	Reworded question
88	Replaced with new question
92	Changed sub-item (1) in items a. & c. to remove implausibility of not having to verify any other system operable
93	Replaced with new question
100	Replaced with new question

Facility: PNPS	Date of Exam: 10/03/2003	Pilgrim / VY Combined Sample Plan (Pilgrim Specific)

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 2	G *	Total
1. Emergency & Abnormal Plant Evolutions	1	2	5	2				4	4			3	20	0	3	4	1	8
	2	2	1	1				1	1			1	7	1	0	0	3	4
	Tier Totals	4	6	3				5	5			4	27	1	3	5	3	12
2. Plant Systems	1	4	2	4	2	2	2	3	2	3	1	1	26	1	0	2	1	4
	2	1	1	0	1	0	0	0	4	1	1	3	12	0	0	1	1	2
	Tier Totals	5	3	4	3	2	2	3	6	4	2	4	38	1	0	3	2	6

3. Generic Knowledge and Abilities Categories	1	2	3	4	10	1	2	3	4	7
	2	3	2	3		2	2	2	1	

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					X		**Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION :** (CFR: 41.10 / 43.5 / 45.13) AA2.05 Jet pump operability: Not-BWR-1&2	3.1	
295003 Partial or Complete Loss of AC / 6						X	**Emergency Procedures /Plan** G2.4.1 **Knowledge of EOP entry conditions and immediate action steps.** (CFR: 41.10 / 43.5 / 45.13)	4.3	
295004 Partial or Total Loss of DC Pwr / 6				X			**Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER :** (CFR: 41.7 / 45.6) AA1.03 A.C. electrical distribution	3.4	
295005 Main Turbine Generator Trip / 3		X					**Knowledge of the interrelations between MAIN TURBINE GENERATOR TRIP and the following:** (CFR: 41.7 / 45.8) AK2.01 RPS	3.8	
295006 SCRAM / 1	X						**Knowledge of the operational implications of the following concepts as they apply to SCRAM :** (CFR: 41.8 to 41.10) AK1.01 Decay heat generation and removal	3.7	
295016 Control Room Abandonment / 7					X		**Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT :** (CFR: 41.10 / 43.5 / 45.13) AA2.07 Suppression chamber pressure	3.2	
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:** (CFR: 41.7 / 45.8) AK2.01 System loads	3.3	
295019 Partial or Total Loss of Inst. Air / 8				X			**Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR :** (CFR: 41.7 / 45.6) AA1.04 Service air isolations valves: Plant-Specific	3.3	
295021 Loss of Shutdown Cooling / 4	X						**Knowledge of the operational implications of the following concepts as they apply to LOSS OF SHUTDOWN COOLING :** (CFR: 41.8 to 41.10) AK1.04 Natural circulation	3.6	

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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	#
295023 Refueling Acc Cooling Mode / 8		X					**Knowledge of the interrelations between REFUELING ACCIDENTS and the following:** (CFR: 41.7 / 45.8) AK2.03 Radiation monitoring equipment	3.4	
295024 High Drywell Pressure / 5		X					**Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following:** (CFR: 41.7 / 45.8) EK2.12 Suppression pool cooling	3.5	
295025 High Reactor Pressure / 3						X	**Conduct of Operations** G2.1.32 **Ability to explain and apply system limits and precautions.** (CFR: 41.10 / 43.2 / 45.12)	3.4	
295026 Suppression Pool High Water Temp. / 5		X					**Knowledge of the interrelations between SUPPRESSION POOL HIGH WATER TEMPERATURE and the following:** (CFR: 41.7 / 45.8) EK2.04 SPDS/ERIS/CRIDS/GDS: Plant-Specific	2.5	
295028 High Drywell Temperature / 5					X		**Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE :** (CFR: 41.10 / 43.5 / 45.13) EA2.05 Torus/suppression chamber pressure: Plant-Specific	3.6	
295030 Low Suppression Pool Wtr Lvl / 5				X			**Ability to operate and/or monitor the following as they apply to LOW SUPPRESSION POOL WATER LEVEL:** (CFR: 41.7 / 45.6) EA1.02 RCIC: Plant-Specific	3.4	
295031 Reactor Low Water Level / 2				O X	X		**Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL :** (CFR: 41.10 / 43.5 / 45.13) EA2.02 Reactor power **Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL :** (CFR: 41.10 / 45.3 / 45.13) EA1.11 Condensate	4.0 4.1	
295037 SCRAM Condition Present and 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 :** (CFR: 41.5 / 45.6) EK3.04 Hot shutdown boron weight: Plant-Specific	3.2	

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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	#
295038 High Off-site Release Rate / 9						X	**Equipment Control** G2.2.25 **Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.** (CFR: 43.2)	2.5	
600000 Plant Fire On Site / 8			X				**Knowledge of the reasons for the following responses as they apply to PLANT FIRE ON SITE:** AK3.04 Actions contained in the abnormal procedure for plant fire on site	2.8	
K/A Category Totals:	2	5	2	4	4	3	Group Point Total: 20		20/8

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (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	#
295002 Loss of Main Condenser Vac / 3	X						**Knowledge of the operational implications of the following concepts as they apply to LOSS OF MAIN CONDENSER VACUUM :** (CFR: 41.8 to 41.10) AK1.04 Increased offgas flow	3.0	
295007 High Reactor Pressure / 3									
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 5									
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5			X				**Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL TEMPERATURE :** (CFR: 41.5 / 45.6) AK3.01 Suppression pool cooling operation	3.6	
295014 Inadvertent Reactivity Addition / 1									
295015 Incomplete SCRAM / 1						X	**Equipment Control** G2.2.22 **Knowledge of limiting conditions for operations and safety limits.** (CFR: 43.2 / 45.2)	3.4	
295017 High Off-site Release Rate / 9									
295020 Inadvertent Cont. Isolation / 5 & 7		X					**Knowledge of the interrelations between INADVERTENT CONTAINMENT ISOLATION and the following:** (CFR: 41.7/45.8) AK2.01 Main Steam System	3.6	
295022 Loss of CRD Pumps / 1									
295029 High Suppression Pool Wtr Lvl / 5	X			O			**Ability to operate and/or monitor the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL :** (CFR: 41.8 to 41.10) EK1.01 Containment Integrity	3.4	
295032 High Secondary Containment Area Temperature / 5									
295033 High Secondary Containment Area Radiation Levels / 9					X		**Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS :** (CFR: 41.10 / 43.5 / 45.13) EA2.01 Area radiation levels	3.8	
295034 Secondary Containment Ventilation High Radiation / 9				X			**Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION :** (CFR: 41.7 / 45.6) EA1.02 Process radiation monitoring system	3.9	
295035 Secondary Containment High Differential Pressure / 5									

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (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	#
295036 Secondary Containment High Sump/Area Water Level / 5									
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals	2	1	1	1	1	1	Group Point Total: 7		7/4

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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 (PLANT SPECIFIC) including:** (CFR: 41.7 / 45.7) A3.05 Reactor water level	4.4*	
205000 Shutdown Cooling											X	**Conduct of Operations** G2.1.28 **Knowledge of the purpose and function of major system components and controls.** (CFR: 41.7)	3.2	
206000 HPCI		X					X					**Ability to predict and/or monitor changes in parameters associated with operating the HIGH PRESSURE COOLANT INJECTION SYSTEM controls including:** (CFR: 41.5 / 45.5) A1.08 System lineup: BWR-2,3,4 **Knowledge of electrical power supplies to the following:** (CFR: 41.7) K2.03 Initiation logic: BWR-2,3,4	4.1* 2.8*	
209001 LPCS			X									**Knowledge of the effect that a loss or malfunction of the LOW PRESSURE CORE SPRAY SYSTEM will have on following:** (CFR: 41.7 / 45.4) K3.02 ADS logic	3.8	
211000 SLC	X		O X									**Knowledge of the physical connections and/or cause-effect relationships between STANDBY LIQUID CONTROL SYSTEM and the following:** (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.02 Core plate differential pressure indication **Knowledge of the effect that a loss or malfunction of the STANDBY LIQUID CONTROL SYSTEM will have on following:** (CFR: 41.7 / 45.4) K3.01 †Ability to shutdown the reactor in certain conditions	2.7 4.3*	

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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	#
212000 RPS							X					**Ability to predict and/or monitor changes in parameters associated with operating the REACTOR PROTECTION SYSTEM controls including:** (CFR: 41.5 / 45.5) A1.09 Individual relay status: Plant-Specific	2.7	
215003 IRM			X			X						**Knowledge of the effect that a loss or malfunction of the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM will have on following:** (CFR: 41.7 / 45.4) K3.04 Reactor power indication **Knowledge of the effect that a loss or malfunction of the following will have on the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM :** (CFR: 41.7 / 45.7) K6.04 Detectors	3.6 3.0	
215004 Source Range Monitor		X										**Knowledge of electrical power supplies to the following:** (CFR: 41.7) K2.01 SRM channels/detectors	2.6	
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:** (CFR: 41.5 / 45.5) A1.02 RPS status	3.9	
217000 RCIC					X							**Knowledge of the operational implications of the following concepts as they apply to REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) :** (CFR: 41.5 / 45.3) K5.06 Turbine operation	2.7*	
218000 ADS			X									**Knowledge of the effect that a loss or malfunction of the AUTOMATIC DEPRESSURIZATION SYSTEM will have on following:** (CFR: 41.7 / 45.4) K3.02 Ability to rapidly depressurize the reactor	4.5*	

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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	#
223002 PCIS/Nuclear Steam Supply Shutoff		O						X				**Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:** (CFR: 41.5 / 45.6) A2.02 D.C. electrical distribution failures	2.9	
239002 SRVs	X											**Knowledge of the physical connections and/or cause-effect relationships between RELIEF/SAFETY VALVES and the following:** (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.09 Drywell pressure (for safety valves which discharge to the drywell airspace): Plant-Specific	4.0	
259002 Reactor Water Level Control					O X							**Knowledge of the operational implications of the following concepts as they apply to REACTOR WATER LEVEL CONTROL SYSTEM :** (CFR: 41.5 / 45.3) K5.01 GEMAC/Foxboro/Bailey controller operation: Plant-Specific.	3.1	
261000 SGTS	X											**Knowledge of the physical connections and/or cause-effect relationships between STANDBY GAS TREATMENT SYSTEM and the following:** (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.03 Suppression pool	2.9	
262001 AC Electrical Distribution	O			X						X		**Knowledge of A.C. ELECTRICAL DISTRIBUTION design feature(s) and/or interlocks which provide for the following:** (CFR: 41.7) K4.05 Paralleling of A.C. sources (synchroscope) **Ability to manually operate and/or monitor in the control room:** (CFR: 41.7 / 45.5 to 45.8) A4.01 All breakers and disconnects (including available switch yard): Plant-Specific	3.4 3.4	
262002 UPS (AC/DC)				X								**Knowledge of UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) design feature(s) and/or interlocks which provide for the following:** (CFR: 41.7) K4.01 Transfer from preferred power to alternate power supplies	3.1	

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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	#
263000 DC Electrical Distribution	X							X				**Knowledge of the physical connections and/or cause-effect relationships between D.C. ELECTRICAL DISTRIBUTION and the following:** (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.01 A.C. electrical distribution **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:** (CFR: 41.5 / 45.6) A2.01 Grounds	3.3 2.8	
264000 EDGs						X						**Knowledge of the effect that a loss or malfunction of the following will have on the EMERGENCY GENERATORS (DIESEL/JET) :** (CFR: 41.7 / 45.7) K6.09 D.C. power	3.3	
300000 Instrument Air							O		X			**Ability to monitor automatic operations of the INSTRUMENT AIR SYSTEM including:** (CFR: 41.7 / 45.7) A3.02 Air temperature	2.9	
400000 Component Cooling Water							O		X			**Ability to monitor automatic operations of the CCWS including:** (CFR: 41.7 / 45.7) A3.01 Setpoints on instrument signal levels for normal operations, warnings, and trips that are applicable to the CCWS	3.0	
K/A Category Point Totals	4	2	4	2	2	2	3	2	3	1	1	Group Point Total: 26		26/4

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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				X								**Knowledge of CONTROL ROD DRIVE HYDRAULIC SYSTEM design feature(s) and/or interlocks which provide for the following:** (CFR 41.7) K4.02 Stable system flow when moving control rods (stabilizing valves)	2.6	
201002 RMCS								X				**Ability to (a) predict the impacts of the following on the REACTOR MANUAL CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:** (CFR: 41.5 / 45.6) A2.01 Rod movement sequence timer malfunctions	2.7	
201003 Control Rod and Drive Mechanism														
201006 RWM														
202001 Recirculation														
202002 Recirculation Flow Control		O									X	**Conduct of Operations** G2.1.33 **Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.** (CFR: 43.2 / 43.3 / 45.3)	3.4	
204000 RWCU														
214000 RPIS														
215001 Traversing In-core Probe														
215002 RBM								X				**Ability to (a) predict the impacts of the following on the ROD BLOCK MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:** (CFR: 41.5 / 45.6) A2.01 Withdrawal of control rod in high power region of core: BWR-3,4,5	3.3	

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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	#
216000 Nuclear Boiler Inst.								X				**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:** (CFR: 41.5 / 45.6) A2.11 Heatup or cooldown of the reactor vessel	3.2	
219000 RHR/LPCI: Torus/Pool Cooling Mode		X										**Knowledge of electrical power supplies to the following:** (CFR: 41.7) K2.01 †Valves	2.5*	
223001 Primary CTMT and Aux.					X							**Knowledge of the operational implications of the following concepts as they apply to PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES :** (CFR: 41.5 / 45.3) K5.13 Oxygen concentration measurement: Plant-Specific	2.7	
226001 RHR/LPCI: CTMT Spray Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode														
233000 Fuel Pool Cooling/Cleanup														
234000 Fuel Handling Equipment								X				**Ability to (a) predict the impacts of the following on the FUEL HANDLING EQUIPMENT ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:** (CFR: 41.5 / 45.6) A2.03 †Loss of electrical power	2.8	
239001 Main and Reheat Steam											X	**Equipment Control** G2.2.22 **Knowledge of limiting conditions for operations and safety limits.** (CFR: 43.2 / 45.2)	3.4	
241000 Reactor/Turbine Pressure Regulator									X			**Ability to monitor automatic operations of the REACTOR/TURBINE PRESSURE REGULATING SYSTEM including:** (CFR: 41.7 / 45.7) A3.12 Turbine trip testing	2.9	
245000 Main Turbine Gen. / Aux.														
256000 Reactor Condensate										X		**Ability to manually operate and/or monitor in the control room:** (CFR: 41.7 / 45.5 to 45.8) A4.07 Lights and alarms	2.9	

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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	#
259001 Reactor Feedwater														
268000 Radwaste														
271000 Offgas														
272000 Radiation Monitoring														
286000 Fire Protection														
288000 Plant Ventilation														
290001 Secondary CTMT											X	**Conduct of Operations** G2.1.30 **Ability to locate and operate components / including local controls.** (CFR: 41.7 / 45.7)	3.9	
290003 Control Room HVAC														
290002 Reactor Vessel Internals	O X											**Knowledge of the physical connections and/or cause-effect relationships between REACTOR VESSEL INTERNALS and the following:** (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.19 TIP	2.5	
K/A Category Point Totals	1	1	-	-	1	-	-	4	1	1	3	Group Point Total: 12		12/2

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

ES-401	Generic Knowledge and Abilities Outline (Tier 3)	Form ES-401-3

Facility: PNPS	Date of Exam: 10/03/2003

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.	2.9			
	2.1.20	Ability to execute procedure steps.	4.3			
	2.1.					
	2.1.					
	2.1.					
	2.1.					
	Subtotal					
2. Equipment Control	2.2.31	Reject	2.2			
	2.2.5	Reject	1.6			
	2.2.23	Ability to track limiting conditions for operations.	2.6			
	2.2.11	Knowledge of the process for controlling temporary changes.	2.5			
	2.2.1	Ability to perform pre-startup procedures for the facility / including operating those controls associated with plant equipment that could affect reactivity.	3.7			
	2.2.					
	Subtotal					
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized.	2.5			
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9			
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	Subtotal					
4. Emergency Procedures / Plan	2.4.18	Knowledge of the specific bases for EOPs	2.7			
	2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.	2.8			
	2.4.41	Reject	2.3			
	2.4.19	Knowledge of the EOP layout / symbols / and icons	2.7			
	2.4.					
	2.4.					
	Subtotal					
Tier 3 Point Total				10		7

Facility: PNPS	Date of Exam: 10/03/2003	Pilgrim / VY Combined Sample Plan (Pilgrim Specific)

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 2	G *	Total
1. Emergency & Abnormal Plant Evolutions	1	2	5	2				4	4			3	20	0	3	4	1	8
	2	2	1	1				1	1			1	7	1	0	0	3	4
	Tier Totals	4	6	3				5	5			4	27	1	3	5	3	12
2. Plant Systems	1	4	2	4	2	2	2	3	2	3	1	1	26	1	0	2	1	4
	2	1	1	0	1	0	0	0	4	1	1	3	12	0	0	1	1	2
	Tier Totals	5	3	4	3	2	2	3	6	4	2	4	38	1	0	3	2	6

3. Generic Knowledge and Abilities Categories	1	2	3	4	10	1	2	3	4	7
	2	3	2	3		2	2	2	1	

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 (SRO)	Form ES-401-1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					X		**Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION :** (CFR: 41.10 / 43.5 / 45.13) AA2.02 Neutron monitoring	3.2	
295003 Partial or Complete Loss of AC / 6									
295004 Partial or Total Loss of DC Pwr / 6				X			**Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER :** (CFR: 41.7 / 45.6) AA1.01 D.C. electrical distribution systems	3.4	
295005 Main Turbine Generator Trip / 3									
295006 SCRAM / 1									
295016 Control Room Abandonment / 7									
295018 Partial or Total Loss of CCW / 8					X		**Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER :** (CFR: 41.10 / 43.5 / 45.13) AA2.04 System flow	2.9	
295019 Partial or Total Loss of Inst. Air / 8									
295021 Loss of Shutdown Cooling / 4				X			**Ability to operate and/or monitor the following as they apply to LOSS OF SHUTDOWN COOLING :** (CFR: 41.7 / 45.6) AA1.02 RHR/shutdown cooling	3.5	
295023 Refueling Acc Cooling Mode / 8									
295024 High Drywell Pressure / 5					X		**Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE:** (CFR: 41.10 / 43.5 / 45.13) EA2.02 Drywell temperature	4.0	
295025 High Reactor Pressure / 3					X		**Ability to determine and/or interpret the following as they apply to** HIGH **REACTOR PRESSURE:** (CFR: 41.10 / 43.5 / 45.13) EA2.02 Reactor power	4.2	
295026 Suppression Pool High Water Temp. / 5						X	**Emergency Procedures /Plan** G2.4.3 **Ability to identify post-accident instrumentation.** (CFR: 41.6 / 45.4)	3.8	
295028 High Drywell Temperature / 5									
295030 Low Suppression Pool Wtr Lvl / 5									
295031 Reactor Low Water Level / 2									

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (SRO)							Form ES-401-1	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1									
295038 High Off-site Release Rate / 9									
600000 Plant Fire On Site / 8				O 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	3.1	
K/A Category Totals:	0	0	0	3	4	1	Group Point Total:		8

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (SRO)							Form ES-401-1
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3									
295007 High Reactor Pressure / 3						X	**Equipment Control** G2.2.22 **Knowledge of limiting conditions for operations and safety limits.** (CFR: 43.2 / 45.2)	4.1	
295008 High Reactor Water Level / 2						X	**Equipment Control** G2.2.2 **Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.** (CFR: 45.2)	3.5	
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 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									
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									
295033 High Secondary Containment Area Radiation Levels / 9									
295034 Secondary Containment Ventilation High Radiation / 9			X				**Knowledge of the reasons for the following responses as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION :** (CFR: 41.5 / 45.6) EK3.02 Starting SBGT/FRVS: Plant-Specific	4.1	
295035 Secondary Containment High Differential Pressure / 5									
295036 Secondary Containment High Sump/Area Water Level / 5							**Emergency Procedure/Plan** G2.4.6 **Knowledge of symptom based EOP mitigation based strategies.** (CFR 41.10 / 43.5 / 45.13)		
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals	0	0	1	0	1	2	Group Point Total:		4

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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								X				**Ability to (a) predict the impacts of the following on the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:** (CFR: 41.5 / 45.6) A2.12 Inadequate system flow	3.0	
206000 HPCI														
209001 LPCS								X				***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:** (CFR: 41.5 / 45.6) A2.09 Low suppression pool level	3.3	
211000 SLC														
212000 RPS														
215003 IRM														
215004 Source Range Monitor														
215005 APRM / LPRM														
217000 RCIC														
218000 ADS														
223002 PCIS/Nuclear Steam Supply Shutoff														
239002 SRVs														
259002 Reactor Water Level Control														
261000 SGTS											X	**Conduct of Operations** G2.1.27 **Knowledge of system purpose and or function.** (CFR: 41.7)	2.9	
262001 AC Electrical Distribution														
262002 UPS (AC/DC)														
263000 DC Electrical Distribution														

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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	#
264000 EDGs						X						**Knowledge of the effect that a loss or malfunction of the following will have on the EMERGENCY GENERATORS (DIESEL/JET) :** (CFR: 41.7 / 45.7) K6.01 Starting air	3.9	
300000 Instrument Air														
400000 Component Cooling Water														
K/A Category Point Totals	0	0	0	0	0	1	0	2	0	0	1	Group Point Total:		4

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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														
201003 Control Rod and Drive Mechanism														
201006 RWM														
202001 Recirculation														
202002 Recirculation Flow Control														
204000 RWCU														
214000 RPIS														
215001 Traversing In-core Probe														
215002 RBM														
216000 Nuclear Boiler Inst.														
219000 RHR/LPCI: Torus/Pool Cooling Mode														
223001 Primary CTMT and Aux.														
226001 RHR/LPCI: CTMT Spray Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode											X	**Equipment Control** G2.2.25 **Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.** (CFR: 43.2)	3.7	
233000 Fuel Pool Cooling/Cleanup								X				**Ability to (a) predict the impacts of the following on the FUEL POOL COOLING AND CLEAN-UP ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:** (CFR: 41.5 / 45.6) A2.07 High fuel pool temperature	3.2	
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam														
241000 Reactor/Turbine Pressure Regulator														
245000 Main Turbine Gen. / Aux.														
256000 Reactor Condensate														
259001 Reactor Feedwater														
268000 Radwaste														
271000 Offgas														
272000 Radiation Monitoring														
286000 Fire Protection														
288000 Plant Ventilation														
290001 Secondary CTMT														
290003 Control Room HVAC														
290002 Reactor Vessel Internals														

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

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	#
K/A Category Point Totals	0	0	0	0	0	0	0	1	0	0	1	Group Point Total:		2

Legend: X – K/A selected
O – K/A rejected (see ES-401-4 sheet at the end of RO/SRO section for details)

ES-401	Generic Knowledge and Abilities Outline (Tier 3)	Form ES-401-3

Facility: PNPS	Date of Exam: 10/03/2003

Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.22	Ability to determine Mode of Operation			3.3	
	2.1.25	Ability to obtain and interpret station reference materials such as graphs / monographs / and tables which contain performance data.			3.1	
	2.1.					
	2.1.					
	2.1.					
	2.1.					
	Subtotal					
2. Equipment Control	2.2.21	Knowledge of pre and post maintenance operability requirements.			3.5	
	2.2.27	Knowledge of the refueling process			3.5	
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	Subtotal					
3. Radiation Control	2.3.9	Replaced by 2.2.27				
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.			3.3	
	2.3.11	Ability to control radiation releases			3.2	
	2.3.					
	2.3.					
	2.3.					
	Subtotal					
4. Emergency Procedures / Plan	2.4.40	Knowledge of the SRO's responsibilities in emergency plan implementation.			4.0	
	2.4.43	Replaced by 2.3.11				
	2.4.					
	2.4.					
	2.4.					
	2.4.					
	Subtotal					
Tier 3 Point Total				10		7