Facility	Cooper	Date of Exam: October 2005																
Tier	Group	RO K/A Category Points											SRO-Only Points					
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2		G*		Total
1. Emergency and Abnormal Plant Evolutions	1	2	3	5	N/A			3	3	N/A		4	20	4		3		7
	2	1	1	1				1	1			2	7	2		1		3
	Tier Totals	3	4	6				4	4			6	27	6		4		10
2. Plant Systems	1	2	2	2	3	2	3	3	2	2	3	2	26	2		3		5
	2	2	1	1	1	1	1	1	1	1	1	1	12	1		2		3
	Tier Totals	4	3	3	4	3	4	4	3	3	4	3	38	3		5		8
3. Generic Knowledge and Abilities Categories		1		2		3		4		10		1	2	3	4	7		
		3		2		3		2				2	2	1	2			

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
7. * The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above. Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43. |

ES-401	BWR Examination Outline						Form ES-401-1			
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						AK1.01 Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Natural Circulation (CFR: 41.8 to 41.10)	2.5	1	
295003 Partial or Complete Loss of AC / 6			X				AK3.05 Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : Reactor SCRAM (CFR: 41.5 / 45.6)	3.7	2	
295004 Partial or Total Loss of DC Pwr / 6			X				AK3.03 Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : Reactor SCRAM: Plant-Specific (CFR: 41.5 / 45.6)	3.1	3	
295005 Main Turbine Generator Trip / 3						X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (CFR: 41.10 / 43.2 / 45.6)	4.0	4	
295006 SCRAM / 1					X		AA2.05 Ability to determine and/or interpret the following as they apply to SCRAM :Whether a reactor SCRAM has occurred. (CFR: 41.10 / 43.5 / 45.13)	4.6	5	
295016 Control Room Abandonment / 7			X				AK3.01 Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT : Reactor SCRAM (CFR: 41.5 / 45.6)	4.1	6	
295018 Partial or Total Loss of CCW / 8			X				AK3.04 Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER :Starting standby pump (CFR: 41.5 / 45.6)	3.3	7	
295019 Partial or Total Loss of Inst. Air / 8						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10 / 43.2 / 45.6)4.3	4.0	8	
295021 Loss of Shutdown Cooling / 4				X			AA1.05 Ability to operate and/or monitor the following as they apply to LOSS OF SHUTDOWN COOLING :Reactor recirculation (CFR: 41.7 / 45.6)	3.1	9	
295023 Refueling Acc / 8		X					AK2.03 Knowledge of the interrelations between REFUELING ACCIDENTS and the following: Radiation monitoring equipment.	3.4	10	
295024 High Drywell Pressure / 5		X					EK2.13 Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following: Suppression pool spray: Plant-Specific (CFR: 41.7 / 45.8)	3.8	11	
295025 High Reactor Pressure / 3					X		EA2.04 Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE:Suppression pool level (CFR: 41.10 / 43.5 / 45.13)	3.9	12	
295026 Suppression Pool High Water Temp. / 5			X				EK3.01 Knowledge of the reasons for the following responses as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE:Emergency/normal depressurization. (CFR: 41.5 / 45.6)	3.8	13	

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 **(RO)(Continued)**						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	#	✔
~~295027 High Containment Temperature / 5~~	**See NOTE 1**									
295028 High Drywell Temperature / 5	X						EK1.01 Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL TEMPERATURE : Reactor water level measurement (CFR: 41.8 to 41.10)	3.5	14	
295030 Low Suppression Pool Wtr Lvl / 5					X		EA2.02Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL :Suppression pool temperature (CFR: 41.10 / 43.5 / 45.13)	3.9	15	
295030 Low Suppression Pool Wtr Lvl / 5				X			EA1.06 Ability to operate and/or monitor the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: Condensate storage and transfer (make-up to the suppression pool): Plant-Specific (CFR: 41.7 / 45.6)	3.4	16	
295031 Reactor Low Water Level / 2						X	2.1.30 Ability to locate and operate components / including local controls. (CFR: 41.7 / 45.7)	3.9	17	
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1						X	2.4.31 Knowledge of annunciators alarms and indications / and use of the response instructions. (CFR: 41.10 / 45.3)	3.3	18	
295038 High Off-site Release Rate / 9				X			EA1.06 Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE : Plant ventilation. (CFR: 41.7 / 45.6)	3.5	19	
600000 Plant Fire On Site / 8		X					AK2.04 Knowledge of the interrelations between PLANT FIRE ON SITE and the following:Breakers / relays / and disconnects	2.5	20	
K/A Category Totals:	2	3	5	3	3	4	Group Point Total		20	

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									
295003 Partial or Complete Loss of AC / 6					X		AA2.04 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : System lineups (CFR: 41.10 / 43.5 / 45.13)	3.7	
295004 Partial or Total Loss of DC Pwr / 6						X	2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies. (CFR: 43.5 / 45.11)	3.6	
295005 Main Turbine Generator Trip / 3					X		AA2.06. Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP : Feedwater temperature (CFR: 41.10 / 43.5 / 45.13)	2.7	
295006 SCRAM / 1									
295016 Control Room Abandonment / 7									
295018 Partial or Total Loss of CCW / 8									
295019 Partial or Total Loss of Inst. Air / 8					X		AA2.02 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : Status of safety-related instrument air system loads (see AK2.1 - AK2.19) (CFR: 41.10 / 43.5 / 45.13)	3.7	
295021 Loss of Shutdown Cooling / 4									
295023 Refueling Acc / 8					X		AA2.05 Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS : Entry conditions of emergency plan (CFR: 41.10 / 43.5 / 45.13)	4.6	
295024 High Drywell Pressure / 5						X	2.1.32 Ability to explain and apply system limits and precautions. (CFR: 41.10 / 43.2 / 45.12)	3.8	
295025 High Reactor Pressure / 3									
295026 Suppression Pool High Water Temp. / 5									
~~295027 High Containment Temperature / 5~~	**See Note 1**								
295028 High Drywell Temperature / 5						X	2.4.6 Knowledge symptom based EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)	4.0	
295030 Low Suppression Pool Wtr Lvl / 5									
295031 Reactor Low Water Level / 2									
295037 SCRAM Condition Present and Power Above APRM Downscale									
295038 High Off-site Release Rate / 9									
600000 Plant Fire On Site / 8									
K/A Category Totals:					4	3	Group Point Total		7

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	2.1.14 Knowledge of system status criteria which require the notification of plant personnel. (CFR: 43.5 / 45.12)	2.5	21
295007 High Reactor Pressure / 3									
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2		X					AK2.03 Knowledge of the interrelations between LOW REACTOR WATER LEVEL and the following: Recirculation system. (CFR: 41.7 / 45.8)	3.1	22
295010 High Drywell Pressure / 5	X						AK1.01 Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE : Downcomer submergence: Mark-I&II (CFR: 41.8 to 41.10)	3.0	23
~~295011 High Containment Temp / 5~~	See Note 1								
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1			X				AK3.01 Knowledge of the reasons for the following responses as they apply to INADVERTENT REACTIVITY ADDITION: Reactor SCRAM (CFR: 41.5 / 45.6)	4.1	24
295015 Incomplete SCRAM / 1									
295017 High Off-site Release Rate / 9									
295020 Inadvertent Cont. Isolation / 5 & 7						X	2.4.50 Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (CFR: 45.3)	3.3	25
295022 Loss of CRD Pumps / 1									
295029 High Suppression Pool Wtr Lvl / 5					X		EA2.03 Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL :Drywell/containment water level (CFR: 41.10 / 43.5 / 45.13)	3.4	26
295032 High Secondary Containment Area Temperature / 5									
295033 High Secondary Containment Area Radiation Levels / 9									
295034 Secondary Containment Ventilation High Radiation / 9									

ES-401	BWR Examination Outline						Form ES-401-1		
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 **(RO)(continued)**									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295035 Secondary Containment High Differential Pressure / 5				X			EA1. Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: SBGT/FRVS (CFR: 41.7 / 45.6)	3.8	27
295036 Secondary Containment High Sump/Area Water Level / 5									
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Totals:	1	1	1	1	1	2	Group Point Total		7

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									
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 5									
~~295011 High Containment Temp / 5~~	See Note 1								
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1					X		AA2.05 Ability to determine and/or interpret the following as they apply to INADVERTENT REACTIVITY ADDITION : †Violation of safety limits (CFR: 41.10 / 43.5 / 45.13)	4.6	
295015 Incomplete SCRAM / 1						X	2.4.6 Knowledge symptom based EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)	4.0	
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		EA2.02 Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION : Cause of high radiation levels (CFR: 41.10 / 43.5 / 45.13)	4.2	
295035 Secondary Containment High Differential Pressure / 5									
295036 Secondary Containment High Sump/Area Water Level / 5									
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Totals:					2	1	Group Point Total		3

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					A1.08Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) controls including: †Emergency generator loading (CFR: 41.5 / 45.5)	3.7	28
205000 Shutdown Cooling			X									K3.01 Knowledge of the effect that a loss or malfunction of the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) will have on following: Reactor pressure (CFR: 41.7 / 45.4)	3.3	29
206000 HPCI											X	2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation. (CFR: 45.2 / 45.6)	3.9	30
206000 HPCI		X										K2.02 Knowledge of electrical power supplies to the following: System pumps: BWR-2,3,4 (CFR: 41.7)	2.8	31
~~207000 Isolation (Emergency)Condenser~~	See Note 2													
209001 LPCS										X		A4.11 Ability to manually operate and/or monitor in the control room: System flow (CFR: 41.7 / 45.5 to 45.8)	3.7	32
~~209002 HPCS~~	See Note 3													
211000 SLC									X			A3.01 Ability to monitor automatic operations of the STANDBY LIQUID CONTROL SYSTEM including: Pump discharge pressure: Plant-Specific (CFR: 41.7 / 45.7)	3.5	33
212000 RPS				X								K4.03 Knowledge of REACTOR PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: The prevention of supplying power to a given RPS bus from multiple sources simultaneously (CFR: 41.7)	3.0	34
215003 IRM							X					A1. 04 Ability to predict and/or monitor changes in parameters associated with operating the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM controls including: Control rod block status (CFR: 41.5 / 45.5)	3.4	35
215003 IRM					X							K5.01 Knowledge of the operational implications of the following concepts as they apply to INTERMEDIATE RANGE MONITOR (IRM) SYSTEM : Detector operation (CFR: 41.5 / 45.3)	2.6	36
215004 Source Range Monitor										X		A4.05 Ability to manually operate and/or monitor in the control room: SRM back panel switches, meters, and indicating lights (CFR: 41.7 / 45.5 to 45.8)	3.1	37

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 1 **(RO)(Continued)**											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	#
215005 APRM / LPRM				X								K4.02 Knowledge of AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM design feature(s) and/or interlocks which provide for the following:Reactor SCRAM signals (CFR: 41.7)	4.1	38
217000 RCIC						X						K6.01 Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) : Electrical power (CFR: 41.7 / 45.7)	3.4	39
218000 ADS				X								K4.03 Knowledge of AUTOMATIC DEPRESSURIZATION SYSTEM design feature(s) and/or interlocks which provide for the following: ADS logic control (CFR: 41.7)	3.8	40
223002 PCIS/Nuclear SteamSupply Shutoff							X					A1.01 Ability to predict and/or monitor changes in parameters associated with operating the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF controls including: System indicating lights and alarms (CFR: 41.5 / 45.5)	3.5	41
239002 SRVs	X											K1.07 Knowledge of the physical connections and/or cause effect relationships between RELIEF/SAFETY VALVES and the following: Suppression pool (CFR: 41.2 to 41.9 / 45.7 to 45.8)	3.6	42
239002 SRVs		X										K2.01 Knowledge of electrical power supplies to the following: SRV solenoids (CFR: 41.7)	2.8	43
259002 Reactor Water LevelControl						X						K6.03 Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR WATER LEVEL CONTROL SYSTEM : Main steam flow input (CFR: 41.7 / 45.7)	3.1	44
261000 SGTS						X						K6.01 Knowledge of the effect that a loss or malfunction of the following will have on the STANDBY GAS TREATMENT SYSTEM : A.C. electrical distribution (CFR: 41.7 / 45.7)	2.9	45
262001 AC Electrical Distribution											X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10 / 43.2 / 45.6)	4.0	46
262001 AC Electrical Distribution									X			A3.02 Ability to monitor automatic operations of the A.C. ELECTRICAL DISTRIBUTION including: Automatic bus transfer (CFR: 41.7 / 45.7)	3.2	47

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 1 **(RO)(Continued)**											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	#
262002 UPS (AC/DC)								X				A2.01 Ability to (a) predict the impacts of the following on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of...: (CFR: 41.5 / 45.6) Under voltage (2.6/2.8)	2.6	48
263000 DC ElectricalDistribution								X				A2.02 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: Loss of ventilation during charging (CFR: 41.5 / 45.6)	2.6	49
264000 EDGs					X							K5.06 Knowledge of the operational implications of the following concepts as they apply to EMERGENCY GENERATORS (DIESEL/JET) : Load sequencing (CFR: 41.5 / 45.3)	3.4	50
300000 Instrument Air	X											K1.04 Knowledge of the connections and / or cause effect relationships between INSTRUMENT AIR SYSTEM and the following: Cooling water to compressor (CFR: 41.2 to 41.9 / 45.7 to 45.8)	2.8	51
400000 Component CoolingWater			X									K3.01 Knowledge of the effect that a loss or malfunction of the CCWS will have on the following: (CFR: 41.7 / 45.6) Loads cooled by CCWS	2.9	52
400000 Component CoolingWater										X		A4.01 Ability to manually operate and / or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.01 CCW indications and control	3.1	53
K/A Category Point Totals:	2	2	2	3	2	3	3	2	2	3	2			26

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: InjectionMode								X				A2.06 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: Emergency generator failure (CFR: 41.5 / 45.6)	3.9	
205000 Shutdown Cooling														
206000 HPCI											X	2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. (CFR: 43.2)	3.7	87
~~207000 Isolation (Emergency)Condenser~~	Note 2													
209001 LPCS														
~~209002 HPCS~~	Note 3													
211000 SLC											X	2.2.22 Knowledge of limiting conditions for operations and safety limits. (CFR: 43.2 / 45.2)	4.1	
212000 RPS														
215003 IRM														
215004 Source Range Monitor														
215005 APRM / LPRM														
217000 RCIC														
218000 ADS														
223002 PCIS/Nuclear SteamSupply Shutoff														
239002 SRVs								X				A2.06 Ability to (a) predict the impacts of the following on the RELIEF/SAFETY VALVES ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Reactor high pressure (CFR: 41.5 / 45.6)	4.3	
259002 Reactor Water LevelControl														
261000 SGTS														
262001 AC ElectricalDistribution														
262002 UPS (AC/DC)														
263000 DC ElectricalDistribution														
264000 EDGs														
300000 Instrument Air											X	2.1.14 Knowledge of system status criteria which require the notification of plant personnel. (CFR: 43.5 / 45.12)	3.3	
400000 Component CoolingWater														
K/A Category Point Totals:								2			3			5

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 2 (RO)											Form ES-401-1		
System#/Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
201001 CRD Hydraulic														
201002 RMCS							X					A1.01 Ability to predict and/or monitor changes in parameters associated with operating the REACTOR MANUAL CONTROL SYSTEM controls including: CRD drive water flow (CFR: 41.5 / 45.5)	2.8	54
201003 Control Rod and Drive Mechanism														
~~201004 RSCS~~	Note 4													
~~201005 RCIS~~	Note 5													
201006 RWM						X						K6.05 Knowledge of the effect that a loss or malfunction of the following will have on the ROD WORTH MINIMIZER SYSTEM (RWM) (PLANT SPECIFIC) : Steam flow input: P-Spec(Not-BWR6) (CFR: 41.7 / 45.7)	2.7	55
202001 Recirculation														
202002 Recirculation Flow Control														
204000 RWCU				X								K4.04 Knowledge of REACTOR WATER CLEANUP SYSTEM design feature(s) and/or interlocks which provide for the following: System isolation upon-receipt of isolation signals (CFR: 41.7)	3.5	56
214000 RPIS														
215001 Traversing In-core Probe														
215002 RBM														
216000 Nuclear Boiler Inst.					X							K5.04 Knowledge of the operational implications of the following concepts as they apply to NUCLEAR BOILER INSTRUMENTATION : Vessel differential pressure measurement (CFR: 41.5 / 45.3)	2.8	57
219000 RHR/LPCI:Torus/Pool Cooling Mode											X	2.2.22 Knowledge of limiting conditions for operations and safety limits. (CFR: 43.2 / 45.2)	3.4	58
223001 Primary CTMT and Aux.														
226001 RHR/LPCI: CTMT Spray Mode		X										K2.02 Knowledge of electrical power supplies to the following: Pumps(CFR: 41.7)	2.9	59
230000 RHR/LPCI: Torus/Pool Spray Mode														
233000 Fuel Pool Cooling/Cleanup									X			A3.02 Ability to monitor automatic operations of the FUEL POOL COOLING AND CLEAN-UP including: Pump trip(s) (CFR: 41.7 / 45.7)	2.6	60
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam														

239003 MSIV Leakage Control														

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 2 (RO)(Continued)											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	#
241000 Reactor/Turbine Pressure Regulator			X									K3.02 Knowledge of the effect that a loss or malfunction of the REACTOR/TURBINE PRESSURE REGULATING SYSTEM will have on following: Reactor pressure (CFR: 41.7 / 45.4)	4.2	61
245000 Main Turbine Gen. / Aux.														
256000 Reactor Condensate														
259001 Reactor Feedwater	X											K1.05 Knowledge of the physical connections and/or cause effect relationships between REACTOR FEEDWATER SYSTEM and the following: Condensate system (CFR: 41.2 to 41.9 / 45.7 to 45.8)	3.2	62
268000 Radwaste	X											K1.09 Knowledge of the physical connections and/or causeeffect relationships between RADWASTE and the following: ECCS systems (CFR: 41.2 to 41.9 / 45.7 to 45.8)	2.6	63
271000 Offgas														
272000 Radiation Monitoring										X		A4.06 Ability to manually operate and/or monitor in the control room: †Manually trip process radiation monitor logic (CFR: 41.7 / 45.5 to 45.8)	2.9	64
286000 Fire Protection								X				A2.07 Ability to (a) predict the impacts of the following on the FIRE PROTECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences...: (CFR: 41.5 / 45.6) Inadvertent system initiation (2.9/2.9)	2.9	65
288000 Plant Ventilation														
290001 Secondary CTMT														
290003 Control Room HVAC														
290002 Reactor Vessel Internals														
K/A Category Point Totals:	2	1	1	1	1	1	1	1	1	1	1			12

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														
~~201004 RSCS~~	Note 4													
~~201005 RCIS~~	Note 5													
201006 RWM														
202001 Recirculation								X				A2.08 Ability to (a) predict the impacts of the following on the RECIRCULATION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Recirculation flow mismatch: Plant-Specific (CFR: 41.5 / 45.6)	3.4	
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														
233000 Fuel Pool Cooling/Cleanup														
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam														
239003 MSIV Leakage Control														
241000 Reactor/Turbine Pressure Regulator														
245000 Main Turbine Gen. / Aux														

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 2 (SRO)(Continued)												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	#
256000 Reactor Condensate														
259001 Reactor Feedwater											X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10 / 43.2 / 45.6)	4.3	
268000 Radwaste														
271000 Offgas														
272000 Radiation Monitoring														
286000 Fire Protection														
288000 Plant Ventilation														
290001 Secondary CTMT														
290003 Control Room HVAC											X	2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. (CFR: 43.2)	3.7	
290002 Reactor Vessel Internals														
K/A Category Point Totals:								1			2			3

Tier 3 Generic Knowledge and Abilities Categories RO and SRO						
Facility: Cooper		Date of Exam: 2005				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operaztions	2.1.11	Knowledge of less than one hour technical specification action statements for systems. (CFR: 43.2 / 45.13)	3.0	66		
	2.1.23	Ability to perform specific system and integrated plant procedures during different modes of plant operation. (CFR: 45.2 / 45.6)	3.9	67		
	2.1.30	Ability to locate and operate components / including local controls. (CFR: 41.7 / 45.7)	3.9	68		
	2.1.10	Knowledge of conditions and limitations in the facility license. (CFR: 43.1 / 45.13)			3.9	
	2.1.34	Ability to maintain primary and secondary plant chemistry within allowable limits. (CFR: 41.10 / 43.5 / 45.12)			2.9	
	Subtotal			3		2
2. Equipment Control	2.2.27	Knowledge of the refueling process. (CFR: 43.6 / 45.13)	2.6	69		
	2.2.12	Knowledge of surveillance procedures. (CFR: 41.10 / 45.13)	3.0	70		
	2.2.8	Knowledge of the process for determining if the proposed change / test / or experiment involves an unreviewed safety question. (CFR: 43.3 / 45.13)			3.3	
	2.2.15	Ability to identify and utilize as-built design and configuration change documentation to ascertain expected current plant configuration and operate the plant. (CFR: 43.3 / 45.13)			2.9	
	Subtotal			2		2
3. Radiation Control	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements. (CFR: 41.12 / 43.4. 45.9 / 45.10)	2.6	71		
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. (CFR: 43.4 / 45.10)	2.9	72		
	2.3.9	Knowledge of the process for performing a containment purge. (CFR: 43.4 / 45.10)	2.5	73		
	2.3.6	Knowledge of the requirements for reviewing and approving release permits. (CFR: 43.4 / 45.10)			3.1	
	Subtotal			3		1
4. Emergency Procedures/Plan	2.4.18	Knowledge of the specific bases for EOPs. (CFR: 41.10 / 45.13)	2.7	74		
	2.4.27	Knowledge of fire in the plant procedure. (CFR: 41.10 / 43.5 / 45.13)	3.0	75		
	2.4.8	Knowledge of how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom-based EOPs. (CFR: 41.10 / 43.5 / 45.13)			3.7	
	2.4.29	Knowledge of the emergency plan. (CFR: 43.5 / 45.11)			4.0	
	Subtotal			2		2
Tier 3 Point Total				10		7

Justification for Systems/Evolutions not included for selection in the Outline

Note 1: This category is applicable to only Mark 3 containment, therefore it is not applicable to Cooper.

Note 2: Cooper does not have an isolation condenser.

Note 3: Cooper does not have a high pressure core spray system.

Note 4: Cooper no longer uses a Rod Sequence Control System.

Note 5: Cooper is a BWR 4 and does not have a Rod Control and Information System.