

Facility: BRYON		Date of Exam: June 18, 2000 <i>AMS</i>		Exam Level: <input checked="" type="checkbox"/> RO/SRO		
Item Description				Initial		
				a	b*	c#
1.	Questions and answers technically accurate and applicable to facility			<i>DM</i> <i>GM</i>	<i>MFB</i>	<i>AMS</i>
2.	a. NRC K/As referenced for all questions b. Facility learning objectives referenced as available			<i>DM</i> <i>GM</i>	<i>MFB</i>	<i>AMS</i>
3.	RO/SRO overlap is no more than 75 percent, and SRO questions are appropriate per Section D.2.d of ES-401			<i>DM</i> <i>GM</i>	<i>MFB</i>	<i>AMS</i>
4.	No more than 25 questions are duplicated from [practice exams, quizzes, and] the last two NRC licensing exams; enter the actual number of duplicated questions at right	NRC	Other	<i>DM</i> <i>GM</i>	<i>MFB</i>	<i>AMS</i>
		8				
5.	[No (Less than 5 percent) question duplication from the license screening/audit exam (if independently written)]			<i>N/A</i>	<i>MFB</i>	<i>AMS</i>
6.	Bank use meets limits (no more than 50 percent from the bank, at least 10 percent new, and the rest modified); enter the actual question distribution at right	Bank	Modified	<i>DM</i> <i>GM</i>	<i>MFB</i>	<i>AMS</i>
		44	0			
7.	Between 50 and 60 percent of the questions on the exam (including 10 new questions) are written at the comprehension/analysis level; enter the actual question distribution at right	Memory	C/A	<i>DM</i> <i>GM</i>	<i>MFB</i>	<i>AMS</i>
		48	52			
8.	References/handouts provided do not give away answers			<i>DM</i> <i>GM</i>	<i>MFB</i>	<i>AMS</i>
9.	Question distribution meets previously approved examination outline; deviations are justified			<i>DM</i> <i>GM</i>	<i>MFB</i>	<i>AMS</i>
10.	Question psychometric quality and format meet ES, Appendix B, guidelines			<i>DM</i> <i>GM</i>	<i>MFB</i>	<i>AMS</i>
11.	The exam contains 100, one-point, multiple choice items; the total is correct and agrees with value on cover sheet			<i>DM</i> <i>GM</i>	<i>MFB</i>	<i>AMS</i>
		Printed Name / Signature		Date		
a. Author	George Wilson/ <i>[Signature]</i>	Dell McNeil <i>[Signature]</i>		4/13/00		
b. Facility Reviewer(*)	<i>[Signature]</i>			4/19/00		
c. NRC Chief Examiner(*)	Ann Marie Stone/ <i>[Signature]</i>			5/15/00		
d. NRC Regional Supervisor(*)	David Hills/ <i>[Signature]</i>			5/16/00		
<p>Note: * The facility reviewer's signature is not applicable for NRC-developed examinations; two independent NRC reviews are required. # See special instructions (Section E.2.c) for Items 1, 4, 5, and 6. [] The items in brackets do not apply to NRC-prepared examinations.</p>						

Final Written Exam Ready to Administer: *Ann Marie Stone*  
6/18/2000

Authorization to Administer: *David E. Hills*  
6-16-00

Facility: BYRON		Date of Exam: 06/19/00						Exam Level: RO					
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	2	3				4	3			1	16
	2	2	3	4				2	4			2	17
	3	1	1	0				1	0			0	3
	Tier Totals	7	4	7				7	8			3	36
2. Plant Systems	1	1	1	1	4	1	2	5	2	2	2	2	23
	2	3	2	2	2	3	1	0	3	1	1	2	20
	3	0	0	2	2	0	0	0	2	0	1	1	8
	Tier Totals	4	3	5	8	3	3	6	7	3	4	5	51
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13
					3		3		3		4		
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>2. Actual point totals must match those specified in the table.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6.* The generic 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.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>													

ES-401

PWR RO Examination Outline  
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

Form ES-401-4

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1			X				K 3.01 BORATION AND EMERGENCY BORATION WITH STUCK ROD	4.0	1
000015/17 RCP Malfunctions / 4				X			A 1.22 RCP SEAL FAILURE/MALFUNCTION	4.0	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4		X					K 2.02 NATURAL CIRCULATION AND HEAT REMOVAL SYSTEM	3.6	1
000024 Emergency Boration / 1			X				K 3.01 WHEN EMERGENCY BORATION IS REQUIRED	4.1	1
000026 Loss of Component Cooling Water / 8					X		A 2.01 LOCATION OF LEAK IN CCWS	2.9	1
000027 Pressurizer Pressure Control System Malfunction / 3				X			A 1.01 PZR HTRS, SPRAYS, AND PORVS	4.0	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4			X				K 3.02 ESFAS INITIATION	4.4	1
CE/A11; W/E08 RCS Overcooling - PTS / 4	X						K 1.2 NORMAL, ABNORMAL, AND EMERGENCY PROCEDURES	3.4	1
000051 Loss of Condenser Vacuum / 4					X		A 2.02 CONDITIONS REQUIRING RX/TURBINE TRIP	3.9	1
000055 Station Blackout / 6		X						3.3	1
000057 Loss of Vital AC Elec. Inst. Bus / 6						X	K 2.4.10 KNOWLEDGE OF ARP'S	3.0	1
000062 Loss of Nuclear Service Water / 4				X			A 1.01 NSW TEMP INDICATIONS	3.0	1
000067 Plant Fire On-site / 9	X						K 1.01 FIRE CLASSIFICATIONS	2.9	1
000068 (BW/A06) Control Room Evac. / 8					X		A 2.09 SATURATION MARGIN	4.1	1
000069 (W/E14) Loss of CTMT Integrity / 5				X			A 1.2 OPERATING CHARACTERISTICS OF FACILITY	3.3	1
000074 (W/E06&E07) Inad. Core Cooling / 4	X						K 1.03 PROCESS FOR REMOVING DECAY HEAT FROM CORE	4.5	1
BW/E03 Inadequate Subcooling Margin / 4							N/A	0	0
000076 High Reactor Coolant Activity / 9							N/A	0	0
BW/A02&A03 Loss of NNI-X/Y / 7							N/A	0	0
K/A Category Totals:	3	2	3	4	3	1	Group Point Total:		16

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1					X		A 2.05 UNCONTROLLED ROD WITHDRAWAL	4.4	1
000003 Dropped Control Rod / 1						X	K 2.4.4 ABILITY TO RECOGNIZE ABNORMAL CONDITIONS	4.0	1
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1		X					K 2.02 BREAKERS, RELAYS, AND DISCONNECTS	2.6	1
BW/A01 Plant Runback / 1							N/A	0	0
BW/A04 Turbine Trip / 4							N/A	0	0
000008 Pressurizer Vapor Space Accident / 3					X		A 2.12 PZR LEVEL INDICATIONS	3.4	1
000009 Small Break LOCA / 3			X				K 3.24 ECCS THROTTLING OR TERMINATION CRITERIA	4.1	1
000011 Large Break LOCA / 3						X	K 2.4.18 KNOWLEDGE OF SPECIFIC BASES FOR EOP'S	2.7	1
W/E04 LOCA Outside Containment / 3	X						K 1.2 PROCEDURES ASSOCIATED WITH LOCA OUTSIDE CONT	3.5	1
BW/E08; W/E03 LOCA Cooldown/Depress. / 4			X				K 3.3 MANIPULATION TO OBTAIN RESULTS	3.9	1
W/E11 Loss of Emergency Coolant Recirc. / 4		X					K 2.1 INTERRELATIONS BETWEEN COMPONENTS AND FAILURES	3.6	1
W/EO1 & E02 Rediagnosis & SI Termination / 3							N/A	0	0
000022 Loss of Reactor Coolant Makeup / 2					X		A 2.02 SENSORS AND DETECTORS	3.2	1
000025 Loss of RHR System / 4			X				K 3.01 SHIFT TO ALTERNATE FLOWPATHS	3.1	1
000029 Anticipated Transient w/o Scram / 1				X			A 1.15 AFW SYSTEM	4.1	1
000032 Loss of Source Range NI / 7				X			A 1.01 MANUAL RESTORATION OF POWER	3.1	1
000033 Loss of Intermediate Range NI / 7							N/A	0	0
000037 Steam Generator Tube Leak / 3					X		A 2.01 STEPS NEEDED TO VERIFY UNUSUAL READINGS	3.0	1
000038 Steam Generator Tube Rupture / 3			X				K 3.06 ACTIONS IN EOP'S	4.2	1
000054 (CE/E06) Loss of Main Feedwater / 4	X						K 1.01 MFW LINE BREAK DEPRESSURIZATION	4.1	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4		X						3.4	1
000058 Loss of DC Power / 6							N/A	0	0
000059 Accidental Liquid RadWaste Rel. / 9							N/A	0	0
000060 Accidental Gaseous Radwaste Rel. / 9							N/A	0	0
000061 ARM System Alarms / 7							N/A	0	0
W/E16 High Containment Radiation / 9							N/A	0	0
CE/E09 Functional Recovery							N/A	0	0
K/A Category Point Totals:	2	3	4	2	4	2	Group Point Total:0		17



System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive					X							K 5.05 INTERPRETATION OF RODS	2.8	1
003 Reactor Coolant Pump							X					A 1.09 SEAL FLOW AND D/P	2.8	1
004 Chemical and Volume Control										X		A 4.18 EMERGENCY BORATE VALVE	4.3	1
013 Engineered Safety Features Actuation									X			A 3.02 ACTUATED EQUIPMENT	4.1	1
015 Nuclear Instrumentation							X					A 1.04 QPTR	3.5	1
017 In-core Temperature Monitor						X						K 6.01 SENSORS AND DETECTORS	2.7	1
022 Containment Cooling											X	K 2.1.32 SYSTEM LIMITS	3.4	1
056 Condensate								X				A 2.04 LOSS OF COND PUMPS	2.6	1
059 Main Feedwater				X								K 4.19 FWI	3.2	1
061 Auxiliary/Emergency Feedwater		X										K 2.03AFW DIESEL PUMP	4.0	1
068 Liquid Radwaste				X								K 4.01 SAFETY PRECAUTIONS	3.4	1
071 Waste Gas Disposal				X								K 4.01 PRESSURE FOR WGDT	2.6	1
072 Area Radiation Monitoring											X	K 2.1.14 SYSTEM STATUS CRITERIA	2.5	1
001 Control Rod Drive				X								K 4.02 CONTROL ROD MODE SELECT	3.8	1
003 Reactor Coolant Pump								X				A 2.01 PROBLEMS WITH SEALS	3.5	1
004 Chemical and Volume Control						X						K 6.17 FLOW PATHS	4.4	1
004 Chemical and Volume Control			X									K 3.07 PZR LEVEL AND PRESSURE	3.8	1
013 Engineered Safety Features Actuation							X					A 1.05 MAIN STEAM PRESSURE	3.4	1
013 Engineered Safety Features Actuation										X		A 4.02 RESET OF ESFAS CHANNELS	4.3	1
015 Nuclear Instrumentation							X					A 1.01 NIS CALIBRATION	3.5	1
015 Nuclear Instrumentation									X			A 3.04 CHANNEL DEVIATION	3.3	1
061 Auxiliary/Emergency Feedwater							X					A 1.05 AFW FLOW/AMPS	3.6	1
061 Auxiliary/Emergency Feedwater	X											K 1.02 MFW SYSTEM	3.4	1
K/A Category Point Totals:	1	1	1	4	1	2	5	2	2	2	2	Group Point Total:		23

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PWR RO Examination Outline  
Plant Systems - Tier 2/Group 2

Form ES-401-4

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant						X						K 6.02 RCP	3.6	1
006 Emergency Core Cooling		X										K 2.04 ESFAS OPERATED VALVES	3.6	1
010 Pressurizer Pressure Control									X			A 3.02 PZR PRESSURE	3.6	1
011 Pressurizer Level Control					X							K 5.12 PZR LEVEL PROGRAM	3.2	1
012 Reactor Protection								X				A 2.04 POWER SUPPLY	3.1	1
014 Rod Position Indication					X							K 5.01 RPIS AND STEP COUNTER	2.7	1
016 Non-nuclear Instrumentation	X											K 1.01 RCS	3.4	1
026 Containment Spray										X		A 4.01 CSS CONTROLS	4.5	1
029 Containment Purge											X	K 2.1.27 SYSTEM FUNCTION	2.8	1
033 Spent Fuel Pool Cooling				X								K 4.05 SDM	3.1	1
035 Steam Generator					X								3.6	1
039 Main and Reheat Steam								X				A 2.04 STEAM DUMP	3.4	1
055 Condenser Air Removal			X									K 3.01 AIR REMOVAL PUMP	2.5	1
062 AC Electrical Distribution		X										K 2.01 MAJOR SYSTEM LOADS	3.3	1
063 DC Electrical Distribution			X									K 3.02 COMPONENTS USING DC POWER	3.5	1
064 Emergency Diesel Generator				X								K 4.11 SAFEGUARDS LOAD SEQUENCER	3.5	1
073 Process Radiation Monitoring	X											K 1.01 PRM SYSTEMS	3.6	1
075 Circulating Water	X											K 1.02 LIQUIS RADWASTE	2.9	1
079 Station Air											X	K 2.1.28 MAJOR SYSTEM COMPONENTS	3.2	1
086 Fire Protection								X				A 2.02 FPS HEADER PRESSURE	3.0	1
K/A Category Point Totals:	3	2	2	2	3	1	0	3	1	1	2	Group Point Total:		20



Facility: BYRON      Date of Exam: 06/19/00      Exam Level: RO				
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.1	KNOWLEDGE OF CONDUCT OF OPS	3.7	1
	2.1.3	KNOWLEDGE OF SHIFT TURNOVER	3.0	1
	2.1.12	KNOWLEDGE OF TS	3.4	1
	Total			
Equipment Control	2.2.11	KNOWLEDGE OF TEMP CHANGES	2.5	1
	2.2.12	KNOWLEDGE OF SURVEILLANCES	3.0	1
	2.2.13	KNOWLEDGE OF TAGGING	3.6	1
	Total			
Radiation Control	2.3.1	KNOWLEDGE OF 10CFR20	2.6	1
	2.3.4	KNOWLEDGE OF EXPOSURE LIMITS	2.5	1
	2.3.10	ABILITY TO REDUCE EXPOSURE	2.9	1
	Total			
Emergency Procedures/ Plan	2.4.1	KNOWLEDGE OF EOP'S	4.3	1
	2.4.2	KNOWLEDGE OF SYSTEM SETPOINTS	3.9	1
	2.4.3	ABILITY TO IDENTIFY PAM	3.5	1
	2.4.6	KNOWLEDGE OF MITIGATION STRATEGY	3.1	1
	Total			
Tier 3 Point Total (RO/SRO)				13

Facility: BRYON		Date of Exam: June 19, 2000		Exam Level: RO/SRO		
Item Description				Initial		
				a	b*	c*
1.	Questions and answers technically accurate and applicable to facility			MF3 Gm	DP	AMS
2.	a. NRC K/As referenced for all questions b. Facility learning objectives referenced as available			MF3 Gm	DP	AMS
3.	RO/SRO overlap is no more than 75 percent, and SRO questions are appropriate per Section D.2.d of ES-401			MF3 Gm	DP	AMS
4.	No more than 25 questions are duplicated from [practice exams, quizzes, and] the last two NRC licensing exams; enter the actual number of duplicated questions at right	NRC	Other	MF3	DP	AMS
		6	—			
5.	[No (Less than 5 percent) question duplication from the license screening/audit exam (if independently written)]			N/A	NA	AMS
6.	Bank use meets limits (no more than 50 percent from the bank, at least 10 percent new, and the rest modified); enter the actual question distribution at right	Bank	Modified	MF3	DP	AMS
		39	—			
7.	Between 50 and 60 percent of the questions on the exam (including 10 new questions) are written at the comprehension/analysis level; enter the actual question distribution at right	Memory	C/A	MF3	DP	AMS
		49	51			
8.	References/handouts provided do not give away answers			MF3 Gm	DP	AMS
9.	Question distribution meets previously approved examination outline; deviations are justified			MF3 Gm	DP	AMS
10.	Question psychometric quality and format meet ES, Appendix B, guidelines			MF3 Gm	DP	AMS
11.	The exam contains 100, one-point, multiple choice items; the total is correct and agrees with value on cover sheet			MF3 Gm	DP	AMS
<p>Printed Name / Signature</p> <p>a. Author: George Wilson / <i>Michael Burt</i> / <i>Ann Marie Stone</i> / <i>Michael Burt</i> Date: 4/13/00</p> <p>b. Facility Reviewer(*): <i>David Hillis</i> / <i>Ann Marie Stone</i> Date: 5/16/00</p> <p>c. NRC Chief Examiner(*): <i>Bell McNeil</i> / <i>Ann Marie Stone</i> / <i>Ann Marie Stone</i> Date: 5/25/00</p> <p>d. NRC Regional Supervisor(*): <i>David Hillis</i> / <i>Ann Marie Stone</i> Date: 5/26/00</p>						
<p>Note: * The facility reviewer's signature is not applicable for NRC-developed examinations; two independent NRC reviews are required. # See special instructions (Section E.2.c) for Items 1, 4, 5, and 6. [] The items in brackets do not apply to NRC-prepared examinations.</p>						

Final written exam Ready to Administer - Ann Marie Stone 6/16/2000

Authorization to Administer: David E. Hillis / Ann Marie Stone

6 - 16 - 00

Facility: Byron		Date of Exam: June 20, 2000						Exam Level: SRO					
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	4	3	6				3	5			3	24
	2	1	3	2				1	7			2	16
	3	1	1	0				0	1			0	3
	Tier Totals	6	7	8				4	13			5	43
2. Plant Systems	1	0	2	0	3	2	1	3	1	1	3	3	19
	2	2	2	1	3	2	1	0	2	1	1	2	17
	3	0	0	2	1	0	0	0	1	0	0	0	4
	Tier Totals	2	4	3	7	4	2	3	4	2	4	5	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		17
					5		4		3		5		
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>2. Actual point totals must match those specified in the table.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6.* The generic 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.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>													

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1					X		A 2.05 UNCONTROLLED ROD WITHDRAWAL	4.6	1.0 C
000003 Dropped Control Rod / 1						X	K 2.4.4 ABILITY TO RECOGNIZE ABNORMAL CONDITIONS	4.3	1.0 C
000005 Inoperable/Stuck Control Rod / 1			X				K 3.01 BORATION AND EMERGENCY BORATION WITH STUCK ROD	4.3	1.0 C
000011 Large Break LOCA / 3						X	K 2.4.18 KNOWLEDGE OF SPECIFIC BASES FOR EOP'S	3.6	1.0 C
W/E04 LOCA Outside Containment / 3	X						K 1.2 PROCEDURES ASSOCIATED WITH LOCA OUTSIDE CONT	4.2	1.0 C
W/E01 & E02 Rediagnosis & SI Termination / 3		X					K 2.2 INTERRLATION OF SI TERM AND DHR	3.9	1.0 S
000015/17 RCP Malfunctions / 4				X			A 1.22 RCP SEAL FAILURE/MALFUNCTION	4.2	1.0 C
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4		X					K 2.02 NATURAL CIRCULATION AND HEAT REMOVAL SYSTEM	3.9	1.0 C
000024 Emergency Boration / 1			X				K 3.01 WHEN EMERGENCY BORATION IS REQUIRED	4.4	1.0 S
000026 Loss of Component Cooling Water / 8					X		A 2.01 LOCATION OF LEAK IN CCWS	3.5	1.0 C
000029 Anticipated Transient w/o Scram / 1				X			A 1.15 AFW SYSTEM	3.9	1.0 C
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4			X				K 3.02 ESFAS INITIATION	4.4	1.0 C
CE/A11; W/E08 RCS Overcooling - PTS / 4	X						K 1.2 NORMAL, ABNORMAL, AND EMERGENCY PROCEDURES	4.0	1.0 S
000051 Loss of Condenser Vacuum / 4					X		A 2.02 CONDITIONS REQUIRING RX/TURBINE TRIP	4.1	1.0 C
000055 Station Blackout / 6		X						4.6	1.0 C
000055 Station Blackout / 6			X						1.0 S
000057 Loss of Vital AC Elec. Inst. Bus / 6						X	K 2.4.10 KNOWLEDGE OF ARP'S	3.1	1.0 C
000062 Loss of Nuclear Service Water / 4				X			A 1.01 NSW TEMP INDICATIONS	3.1	1.0 C
000067 Plant Fire On-site / 9					X			4.3	1.0 S
000068 (BW/A06) Control Room Evac. / 8					X		A 2.09 SATURATION MARGIN	4.3	1.0 C
000069 (W/E14) Loss of CTMT Integrity / 5	X							3.6	1.0 S
000074 (W/E06&E07) Inad. Core Cooling / 4	X						K 1.03 PROCESS FOR REMOVING DECAY HEAT FROM CORE	4.9	1.0 C
BW/E03 Inadequate Subcooling Margin / 4			X				K2.01 LOCA COOLDOWN AND INTERLOCKS	4.0	1.0 C
BW/E03 Inadequate Subcooling Margin / 4			X					3.8	1.0
BW/A02&A03 Loss of NNI-X/Y / 7									
K/A Category Totals:	4	3	6	3	5	3	Group Point Total:		24

ES-401	PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2							Form ES-401-3	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1					X			2.8	1.0 S
000008 Pressurizer Vapor Space Accident / 3					X		A 2.12 PZR LEVEL INDICATIONS	3.7	1.0 C
000009 Small Break LOCA / 3					X			4.6	1.0 S
BW/E08; W/E03 LOCA Cooldown - Depress. / 4		X						3.9	1.0 S
W/E11 Loss of Emergency Coolant Recirc. / 4		X					K 2.1 INTERRELATIONS BETWEEN COMPONENTS AND FAILURES	3.9	1.0 C
000022 Loss of Reactor Coolant Makeup / 2					X		A 2.02 CHARGING	3.2	1.0 C
000025 Loss of RHR System / 4			X				K 3.01 SHIFT TO ALTERNATE FLOWPATHS	3.4	1.0 C
000027 Pressurizer Pressure Control System Malfunction / 3				X			A 1.01 PZR HTRS, SPRAYS, AND PORVS	3.9	1.0 C
000033 Loss of Intermediate Range NI / 7						X	K 1.01 EFFECTS ON VOLTAGE CHANGES	3.0	1.0 S
000037 Steam Generator Tube Leak / 3					X		A 2.01 STEPS NEEDED TO VERIFY UNUSUAL READINGS	3.4	1.0 C
000038 Steam Generator Tube Rupture / 3			X				K 3.06 ACTIONS IN EOP'S	4.5	1.0 C
000054 (CE/E06) Loss of Main Feedwater / 4	X						K 1.01 MFW LINE BREAK DEPRESSURIZATION	4.3	1.0 C
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4					X		A 2.01 FACILITY CONDITIONS AND PROCEDURES	4.4	1.0 C
000060 Accidental Gaseous Radwaste Rel. / 9		X						3.2	1.0 S
000061 ARM System Alarms / 7						X	2.4.50 VERIFY SYSTEM ALARM SETPOINTS	3.3	1.0 S
000038 Steam Generator Tube Rupture / 3					X			4.5	1.0 S
K/A Category Point Totals:	1	3	2	1	7	2	Group Point Total:		16



System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive					X							K 5.05 INTERPRETATION OF RODS	3.9	1.0 C
003 Reactor Coolant Pump							X					A 1.09 SEAL FLOW AND D/P	2.8	1.0 C
004 Chemical and Volume Control										X		A 4.18 EMERGENCY BORATE VALVE	4.1	1.0 C
013 Engineered Safety Features Actuation									X			A 3.02 ACTUATED EQUIPMENT	4.2	1.0 C
014 Rod Position Indication					X							K 5.01 RPIS AND STEP COUNTER	3.0	1.0 C
015 Nuclear Instrumentation							X					A 1.04 QPTR	3.7	1.0 S
017 In-core Temperature Monitor						X						K 6.01 SENSORS AND DETECTORS	3.0	1.0 C
022 Containment Cooling											X	G 2.1.32 SYSTEM LIMITS	3.8	1.0 C
026 Containment Spray										X			4.1	1.0 C
026 Containment Spray											X		4.1	1.0 S
056 Condensate								X				A 2.04 LOSS OF COND PUMPS	2.8	1.0 C
059 Main Feedwater				X								K 4.19 FWI	3.4	1.0 C
061 Auxiliary/Emergency Feedwater		X										K 2.03AFW DIESEL PUMP	3.8	1.0 C
068 Liquid Radwaste				X								K 4.01 SAFETY PRECAUTIONS	4.1	1.0 C
071 Waste Gas Disposal				X								K 4.01 PRESSURE FOR WGDT	3.0	1.0 C
072 Area Radiation Monitoring											X	G 2.1.14 SYSTEM STATUS CRITERIA	3.3	1.0 C
003 Reactor Coolant Pump										X			4.6	1.0 C
013 Engineered Safety Features Actuation		X										K2.01 ESFAS	3.8	1.0 S
061 Auxiliary/Emergency Feedwater							X					K5.01 AFW VS RCS HEAT	3.9	1.0 S
K/A Category Point Totals:	0	2	0	3	2	1	3	1	1	3	3	Group Point Total:		19

ES-401

PWR SRO Examination Outline  
Plant Systems - Tier 2/Group 2

Form ES-401-3

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant						X						K 6.02 RCP	3.8	1.0 C
006 Emergency Core Cooling		X										K 2.04 ESFAS OPERATED VALVES	3.8	1.0 C
010 Pressurizer Pressure Control									X			A 3.02 PZR PRESSURE	3.5	1.0 C
011 Pressurizer Level Control					X							K 5.12 PZR LEVEL PROGRAM	3.3	1.0 C
012 Reactor Protection														
016 Non-nuclear Instrumentation	X											K 1.01 RCS	3.4	1.0 C
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control										X		A 4.01 HRPS CONTROLS	4.0	1.0 C
029 Containment Purge											X	G 2.1.27 SYSTEM FUNCTION	2.9	1.0 C
033 Spent Fuel Pool Cooling				X								K 4.05 SDM	3.3	1.0 C
034 Fuel Handling Equipment				X								K 4.02 FUEL MOVEMENT	3.3	1.0 S
035 Steam Generator					X								3.8	1.0 C
039 Main and Reheat Steam														
055 Condenser Air Removal			X									K 3.01 MAIN CONDENSER	2.5	1.0 C
062 AC Electrical Distribution		X										K 2.01 MAJOR SYSTEM LOADS	3.4	1.0 C
064 Emergency Diesel Generator				X									3.9	1.0 C
073 Process Radiation Monitoring	X											K 1.01 PRM SYSTEMS	3.9	1.0 C
075 Circulating Water								X					2.5	1.0 S
079 Station Air											X		2.7	1.0 C
086 Fire Protection								X					3.3	1.0 C
103 Containment														
K/A Category Point Totals:	2	2	1	3	2	1	0	2	1	1	2	Group Point Total:		17

