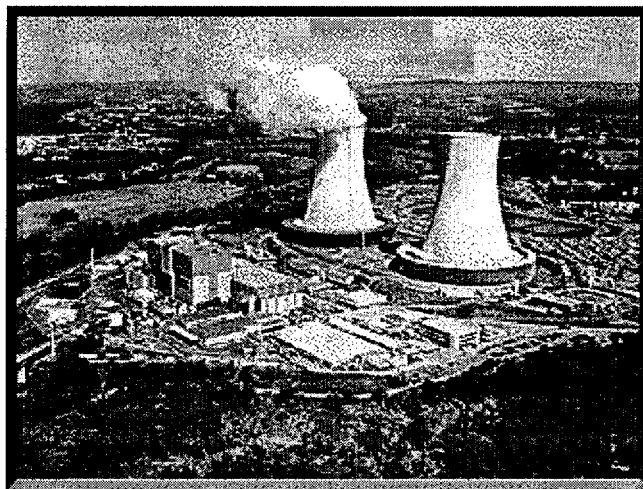


LIMERICK GENERATING STATION
UNITS 1 & 2
2000
INITIAL LICENSE EXAMINATION

WRITTEN
AND
PERFORMANCE
EXAM MATERIALS



NRC COPY

TABLE OF CONTENTS

75 COMMON QUESTIONS

25 RO QUESTIONS

25 SRO QUESTIONS

SCENARIOS

JPMs

CATEGORY A RO QUESTIONS

CATEGORY A SRO QUESTIONS

Facility: Limerick Generating Station		Date of Exam: 03/31/00		Exam Level: SRO									
Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	5	5	4				4	5			3	26
	2	3	2	3				4	3			2	17
	Tier Totals	8	7	7				8	8			5	43
2. Plant Systems	1	3	1	4	4	1	2	2	2	1	1	2	23
	2	1	1	1	1	1	1	1	1	2	2	1	13
	3	1	0	0	1	0	1	1	0	0	0	0	4
	Tier Totals	5	2	5	6	2	4	4	3	3	3	3	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>													

ES-401		BWR SRO Examination Outline							Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1										
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts	
295003 Partial or Complete Loss of AC Pwr / VI						X	2.4.3 Ability to identify post-accident instrumentation (98)	3.8	1	
295006 SCRAM / I				X	X		AA1.06 CRD hydraulic system (99)	3.6	1	
							AA2.06 Cause of reactor SCRAM (21S)	3.8	1	
295007 High Reactor Pressure / III			X		X		AA2.01 Reactor pressure (20)	4.1*	1	
							AK3.06 Reactor/turbine pressure regulating system operation (42S)	3.8	1	
295009 Low Reactor Water Level / II		X			X		AA2.02 Steam flow/feedflow mismatch (19)	3.7	1	
							AK2.01 Reactor water level indication (43S)	4.0	1	
295010 High Drywell Pressure / V						X	2.4.48 Ability to interpret control room indications to verify...(40)	3.8	1	
295013 High Suppression Pool Temp. / V	X						AK1.03 Localized heating (18)	3.3	1	
295014 Inadvertent Reactivity Addition / I		X					AK2.11 Recirculation flow control (41)	3.7	1	
295015 Incomplete SCRAM / I	X						AK1.04 Reactor pressure: Plant-specific (17)	3.8	1	
295016 Control Room Abandonment / VII		X			X		AA2.02 Reactor water level (90S)	4.3*	1	
							AK2.01 Remote shutdown panel: Plant specific (48)	4.5*	1	
295017 High Off-site Release Rate / IX		X					AK2.12 Standby gas treatment/FRVS (50)	3.7	1	
295023 Refueling Accidents Cooling Mode / VIII	X						AK1.03 Inadvertent criticality (74)	4.0	1	
295024 High Drywell Pressure / V				X		X	2.1.23 Ability to perform specific system and integrated...(47)	4.0	1	
							EA1.11 Drywell spray: Mark-I & II (49S)	4.2*	1	
295025 High Reactor Pressure / III		X					EK2.03 RRCS: Plant-specific (75)	4.3	1	
295026 Suppression Pool High Water Temp. / V			X				EK3.04 SBLC injection (46)	4.1*	1	
295027 High Containment Temperature / V										
295030 Low Suppression Pool Water Level / V	X			X			EK1.03 Heat capacity (87S)	4.1*	1	
							KA1.05 HPCI (76)	3.5	1	
295031 Reactor Low Water Level / II					X		EA2.04 Adequate core cooling (44)	4.8*	1	
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / I			X	X			EK3.07 Various alternate methods of control rod insertion...(45)	4.3*	1	
							EA1.10 Alternate boron injection methods: Plant-specific (100S)	3.9	1	
295038 High Off-site Release Rate / IX	X						EK1.02 Protection of the general public (51S)	4.4*	1	
500000 High Containment Hydrogen Conc. / V			X				EK3.03 Operation of hydrogen and oxygen recombiners (77)	3.5	1	
K/A Category Totals:	5	5	4	4	5	3	Group Point Total:			26

ES-401		BWR SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2						Form ES-401-1	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts
295001 Partial or Complete Loss of Forced Core Flow Circulation / I & IV	X						AK1.01 Natural circulation (52)	3.6	1
295002 Loss of Main Condenser Vacuum / III						X	2.1.20 Ability to execute procedure steps (78)	4.2	1
295004 Partial or Total Loss of DC Pwr / VI	X						AK1.05 Loss of breaker protection (53)	3.4	1
295005 Main Turbine Generator Trip / III					X		AA2.03 Turbine valve position (88)	3.1	1
295008 High Reactor Water Level / II				X			AA1.05 RCIC: Plant-specific (57)	3.3	1
295011 High Containment Temperature / V									
295012 High Drywell Temperature / V			X				AK3.01 Increased drywell cooling (54)	3.6	1
295018 Partial or Total Loss of CCW / VIII		X					AK2.01 System loads (1)	3.4	1
295019 Partial or Total Loss of Inst. Air / VIII			X				AK3.02 Standby air compressor operation (2)	3.4	1
295020 Inadvertent Cont. Isolation / V & VII				X			AA1.01 PCIS/NSSSS (79)	3.6	1
295021 Loss of Shutdown Cooling / IV						X	2.1.12 Ability to apply technical specifications for a system (56S)	4.0	1
295022 Loss of CRD Pumps / I		X					AK2.03 Accumulator pressures (55S)	3.4	1
295028 High Drywell Temperature / V				X			EA1.03 Drywell cooling system (3)	3.9	1
295029 High Suppression Pool Water Level / V			X				EK3.02 Lowering suppression pool water level (80)	4.0	1
295032 High Secondary Containment Area Temperature / V					X		EA2.01 Area temperature (59)	3.8	1
295033 High Secondary Containment Area Radiation Levels / IX									
295034 Secondary Containment Ventilation High Radiation / IX					X		EA2.01 Ventilation radiation levels (58)	4.2	1
295035 Secondary Containment High Differential Pressure / V	X						EK1.01 Secondary containment integrity (60S)	4.2*	1
295036 Secondary Containment High Sump/Area Water Level / V									
600000 Plant Fire On Site / VIII				X			AA1.08 Fire fighting equipment used on each class of fire (4)	2.9	1
K/A Category Point Totals:	3	2	3	4	3	2	Group Point Total:		17

ES-401

BWR SRO Examination Outline
Plant Systems - Tier 2/Group 1

Form ES-401-1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts
201000 RCIS														
202002 Recirculation Flow Control							X					A1.07 Recirculation loop flow...(61)	3.1	1
203000 RHR/LPCI: Injection Mode								X				A2.16 Loss of coolant accident (25)	4.5*	1
206000 HPCI			X									K3.02 Reactor pressure control...(81)	3.8*	1
207000 Isolation (Emerg. Condenser)														
209001 LPCS						X						K6.01 AC power (7)	3.4	1
209002 HPCS														
211000 SLC											X	2.1.1 Knowledge of conduct of ops...(89)	3.8	1
212000 RPS		X					X					A1.08 Valve position (63) K2.02 Analog trip system logic...(8S)	3.4 2.9	1 1
215004 Source Range Monitor				X								K4.04 Changing detector position (24)	2.9	1
215005 APRM / LPRM								X				A2.04 SCRAM trip signals (6)	3.9	1
216000 Nuclear Boiler Instrumentation									X			A3.01 Relationship between meter/...(23)	3.4	1
217000 RCIC					X							K5.07 Assist core cooling (5)	3.1	1
218000 ADS			X									K3.02 Ability to rapidly depressurize...(62)	4.6*	1
223001 Primary CTMT and Auxiliaries				X								K4.03 Containment/drywell isolation (22)	3.8	1
223002 PCIS/Nuclear Steam Supply Shutoff				X		X						K4.06 Once initiated, system reset...(27) K6.04 Nuclear boiler instrumentation (26S)	3.5 3.5	1 1
226001 RHR/LPCI: CTMT Spray Mode			X									K3.01 Containment/drywell/supp...(64)	3.7	1
239002 SRV's	X											K1.06 Drywell instrument air/drywell...(9)	3.6	1
241000 Reactor/Turbine Pressure Regulator										X		A4.13 Turbine inlet pressure (66)	2.9	1
259002 Reactor Water Level Control	X											K1.04 Reactor feedwater flow (95)	3.6	1
261000 SGTS			X									K3.01 Secondary containment and...(65)	3.6	1
262001 AC Electrical Distribution				X								K4.06 Redundant power sources to...(96)	3.9	1
264000 EDG's	X											K1.01 AC electrical distribution (97)	4.1	1
290001 Secondary CTMT											X	2.4.6 Knowledge symptom based...(28S)	4.0	1
K/A Category Point Totals:	3	1	4	4	1	2	2	2	1	1	2	Group Point Total:		23

ES-401

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

Form ES-401-1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts
201001 CRD Hydraulic								X				A2.09 Loss of applicable plant air sys...(94)	3.1	1
201002 RMCS									X			A3.01 Control rod block actuation (29)	3.1	1
201004 RSCS														
201006 RWM							X					A1.02 Status of control rod move...(82)	3.5	1
202001 Recirculation			X									K3.07 Vessel bottom head drain...(30)	2.9	1
204000 RWCU	X											K1.11 PCIS/NSSSS (67)	3.7	1
205000 Shutdown Cooling														
214000 RPIS														
215002 RBM														
215003 IRM										X		A4.07 Verification of proper function...(83)	3.6	1
219000 RHR/LPCI: Torus/Pool Cooling Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode						X						K6.08 Nuclear boiler instrumentation (68S)	3.1	1
234000 Fuel Handling Equipment									X			A3.02 Interlock operation (31)	3.7	1
239003 MSIV Leakage Control														
245000 Main Turbine Gen. and Auxiliaries				X								K4.05 Turbine protection (34)	3.0	1
259001 Reactor Feedwater					X							K5.03 Turbine operation: TDRFP's only (10)	2.8	1
262002 UPS (AC/DC)														
263000 DC Electrical Distribution														
271000 Offgas											X	2.3.11 Ability to control radiation...(32)	3.2	1
272000 Radiation Monitoring		X										K2.05 Reactor building ventilation...(33)	2.9	1
286000 Fire Protection														
290003 Control Room HVAC														
300000 Instrument Air														
400000 Component Cooling Water										X		A4.01 CCW indications and control (11)	3.0	1
K/A Category Point Totals:	1	1	1	1	1	1	1	1	2	2	1	Group Point Total:		13

ES-401

**BWR SRO Examination Outline
Plant Systems - Tier 2/Group 3**

Form ES-401-1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts
201003 Control Rod and Drive Mechanism							X					A1.02 CRD drive pressure (12)	2.8	1
215001 Traversing In-core Probe						X						K6.04 Primary containment isolation...(36)	3.4	1
233000 Fuel Pool Cooling and Cleanup				X								K4.07 Supplemental heat removal...(35)	2.9	1
239001 Main and Reheat Steam														
256000 Reactor Condensate														
268000 Radwaste														
288000 Plant Ventilation	X											K1.05 Process radiation monitoring...(13)	3.6	1
290002 Reactor Vessel Internals														
K/A Category Point Totals:	1	0	0	1	0	1	1	0	0	0	0	Group Point Total:		4

Facility: Limerick Generating Station		Date of Exam: 03/31/2000		Exam Level: SRO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.11	Knowledge of less than one hour technical specification action statements for systems (37S)	3.8	1	
	2.1.10	Knowledge of conditions and limitations in the facility license (93)	3.9	1	
	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation (84)	4.4	1	
	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications (69S)	4.0	1	
	2.1.9	Ability to direct personnel activities inside the control room (91S)	4.0	1	
	Total			5	
Equipment Control	2.2.20	Knowledge of the process for managing troubleshooting activities (92S)	3.3	1	
	2.2.19	Knowledge of maintenance work order requirements (38S)	3.1	1	
	2.2.3	(Multi-unit) Knowledge of the design, procedural, and operational differences between units (14)	3.3	1	
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits (85S)	3.7	1	
	Total			4	
Radiation Control	2.3.6	Knowledge of the requirements for reviewing and approving release permits (70S)	3.1	1	
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure (71)	3.3	1	
	2.3.9	Knowledge of the process for performing a containment purge (15)	3.4	1	
	Total			3	
Emergency Procedures and Plan	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material (73S)	3.7	1	
	2.4.12	Knowledge of general operating crew responsibilities during emergency operations (16)	3.9	1	
	2.4.44	Knowledge of emergency plan protective action recommendations (39S)	4.0	1	
	2.4.1	Knowledge of EOP entry conditions and immediate action steps (86S)	4.6	1	
	2.4.16	Knowledge of EOP implementation hierarchy and and coordination with other support procedures (72)	4.0	1	
	Total			5	
Tier 3 Point Total (SRO)				17	

Facility: Limerick Generating Station					Date of Exam: 03/31/2000					Exam Level: RO				
Tier	Group	K/A Category Points											Point Total	
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G		
1. Emergency & Abnormal Plant Evolutions	1	2	2	2				1	4			2	13	
	2	3	4	4				5	1			2	19	
	3	1	1	1				0	1			0	4	
	Tier Totals	6	7	7				6	6			4	36	
2. Plant Systems	1	3	2	3	3	2	2	2	4	3	3	1	28	
	2	2	1	2	3	2	2	2	1	1	2	1	19	
	3	1	0	0	1	0	1	0	0	1	0	0	4	
	Tier Totals	6	3	5	7	4	5	4	5	5	5	2	51	
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13	
					4		3		2		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		BWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1						Form ES-401-2	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts
295005 Main Turbine Generator Trip / III					X		AA2.03 Turbine valve position (88)	3.1	1
295006 SCRAM / I				X			AA1.06 CRD hydraulic system (99)	3.5	1
295007 High Reactor Pressure / III					X		AA2.01 Reactor pressure (20)	4.1*	1
295009 Low Reactor Water Level / II					X		AA2.02 Steam flow/feedflow mismatch (19)	3.6	1
295010 High Drywell Pressure / V						X	2.4.48 Ability to interpret control room indications to verify...(40)	3.5	1
295014 Inadvertent Reactivity Addition / I		X					AK2.11 Recirculation flow control (41)	3.6	1
295015 Incomplete SCRAM / I	X						AK1.04 Reactor pressure: Plant specific (17)	3.8	1
295024 High Drywell Pressure / V						X	2.1.23 Ability to perform specific system and integrated plant...(47)	3.9	1
295025 High Reactor Pressure / III	X						EK1.03 Safety/relief valve tailpipe temperature/pressure...(21R)	3.6	1
		X					EK2.03 RRCS: Plant specific (75)	4.0	1
295031 Reactor Low Water Level / II					X		EA2.04 Adequate core cooling (44)	4.6*	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / I			X				EK3.07 Various alternate methods of control rod insertion...(45)	4.2	1
500000 High Containment Hydrogen Conc. / V			X				EK3.03 Operation of hydrogen and oxygen recombiners (77)	3.0	1
K/A Category Totals:	2	2	2	1	4	2	Group Point Total:		13

ES-401		BWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2						Form ES-401-2	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts
295001 Partial or Complete Loss of Forced Core Flow Circulation / I & IV	X						AK1.01 Natural circulation (52)	3.5	1
295002 Loss of Main Condenser Vacuum / III						X	2.1.20 Ability to execute procedure steps (78)	4.3	1
295003 Partial or Complete Loss of AC Pwr / VI						X	2.4.3 Ability to identify post-accident instrumentation (98)	3.5	1
295004 Partial or Complete Loss of DC Pwr / VI	X						AK1.05 Loss of breaker protection (53)	3.3	1
295008 High Reactor Water Level / II				X			AA1.05 RCIC: Plant specific (57)	3.3	1
295011 High CTMT Temperature / V									
295012 High Drywell Temperature / V			X				AK3.01 Increased drywell cooling (54)	3.5	1
295013 High Suppression Pool Temp. / V	X						AK1.03 Localized heating (18)	3.0	1
295016 Control Room Abandonment / VII		X					AK2.01 Remote shutdown panel: Plant specific (48)	4.4*	1
295017 High Off-site Release Rate / IX		X					AK2.12 Standby gas treatment/FRVS (50)	3.4	1
295018 Partial or Complete Loss of CCW / VIII		X					AK2.01 System loads (1)	3.3	1
295019 Partial or Complete Loss of Inst. Air / VIII			X				AK3.02 Standby air compressor operation (2)	3.5	1
295020 Inadvertent Cont. Isolation / V & VII				X			AA1.01 PCIS/NSSSS (79)	3.6	1
295022 Loss of CRD Pumps / I		X					AK2.07 Reactor pressure (SCRAM assist): Plant specific (42R)	3.4	1
295026 High Suppression Pool Water Temp. / V			X				EK3.04 SBLC injection (46)	3.7	1
295027 High Containment Temperature / V									
295028 High Drywell Temperature / V				X			EA1.03 Drywell cooling system (3)	3.9	1
295029 High Suppression Pool Water Level / V			X				EK3.02 Lowering suppression pool water level (80)	3.6	1
295030 Low Suppression Pool Water Level / V				X			EA1.05 HPCI (76)	3.5	1
295033 High Secondary Containment Area Radiation Levels / IX									
295034 Secondary Containment Ventilation High Radiation / IX					X		EA2.01 Ventilation radiation levels (58)	3.8	1
295038 High Off-site Release Rate / IX									
600000 Plant Fire On Site / VIII				X			AA1.08 Fire fighting equipment used on each class of fire (4)	2.6	1
K/A Category Point Totals:	3	4	4	5	1	2	Group Point Total:	19	

ES-401		BWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3						Form ES-401-2	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts
295021 Loss of Shutdown Cooling / IV		X					AK2.03 RHR/shutdown cooling (43R)	3.6	1
295023 Refueling Accidents / VIII	X						AK1.03 Inadvertent criticality (74)	3.7	1
295032 High Secondary Containment Area Temperature / V					X		EA2.01 Area temperature (59)	3.8*	1
295035 Secondary Containment High Differential Pressure / V			X				EK3.01 Blowout panel operation: Plant specific (90R)	2.8	1
295036 Secondary Containment High Sump/Area Water Level / V									
K/A Category Point Totals:	1	1	1	0	1	0	Group Point Total:		4

ES-401

**BWR RO Examination Outline
Plant Systems - Tier 2/Group 1**

Form ES-401-2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts
201001 CRD Hydraulic								X				A2.09 Loss of applicable plant air sys (94)	3.2	1
201002 RMCS									X			A3.01 Control rod block actuation (29)	3.2	1
201003 RCIS														
202002 Recirculation Flow Control							X					A1.07 Recirc loop flow: Plant specific (61)	3.1	1
203000 RHR/LPCI: Injection Mode								X				A2.16 Loss of coolant accident (25)	4.4*	1
206000 HPCI			X									K3.02 Rx pressure control: BWR-2,3,4 (81)	3.8*	1
207000 Isolation (Emerg.) Condenser														
209001 LPCS						X						K6.01 AC power (7)	3.4	1
209002 HPCS														
211000 SLC		X									X	K2.02 Explosive valves (49R) 2.1.1 Knowledge of conduct of ops...(89)	3.1* 3.7	1 1
212000 RPS							X	X				A1.08 Valve position (63) A2.21 Failure of individual relays to...(87R)	3.4 3.6	1 1
215003 IRM										X		A4.07 Verification of proper function...(83)	3.6	1
215004 SRM				X								K4.04 Changing detector position (24)	2.8	1
215005 APRM / LPRM								X	X			A2.04 SCRAM trip signals (6) A3.08 Control rod block status (55R)	3.8 3.7	1 1
216000 Nuclear Boiler Instrumentation									X			A3.01 Relationship between meter...(23)	3.4	1
217000 RCIC		X			X							K2.03 RCIC flow controller (51R) K5.07 Assist core cooling (5)	2.7* 3.1	1 1
218000 ADS			X									K3.02 Ability to rapidly depressurize...(62)	4.5*	1
223001 Primary CTMT and Auxiliaries				X								K4.03 Containment/drywell isolation (22)	3.7	1
223002 PCIS/Nuclear Steam Supply Shutoff				X								K4.06 Once initiated, system reset...(27)	3.4	1
239002 SRV's	X											K1.06 Drywell instrument air/drywell...(9)	3.4	1
241000 Reactor/Turbine Pressure Regulator										X		A4.13 Turbine inlet pressure (66)	2.9	1
259001 Reactor Feedwater					X	X						K5.03 Turbine operation: TDRFP's only (10) K6.09 Reactor feedwater pump...(100R)	2.8 2.8	1 1
259002 Reactor Water Level Control	X											K1.04 Reactor feedwater flow (95)	3.5	1
261000 SGTS			X									K3.01 Secondary containment and...(65)	3.3	1
264000 EDG's	X									X		A4.02 Synchroscope (92R) K1.01 AC electrical distribution (97)	3.4 3.8	1 1
K/A Category Point Totals:	3	2	3	3	2	2	2	4	3	3	1	Group Point Total:		28

ES-401

**BWR RO Examination Outline
Plant Systems - Tier 2/Group 2**

Form ES-401-2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts
201003 Control Rod and Drive Mechanism							X					A1.02 CRD drive pressure (12)	2.8	1
201004 RCS														
201006 RWM							X					A1.02 Status of control rod ...(82)	3.4	1
202001 Recirculation			X									K3.07 Vessel bottom head drain...(30)	2.9	1
204000 RWCU	X											K1.11 PCIS/NSSSS (67)	3.5	1
205000 Shutdown Cooling										X		A4.02 SDC/RHR suction valves (91R)	3.6	1
214000 RPIS					X							K5.01 Reed switches (37R)	2.7	1
215002 RBM														
219000 RHR/LPCI: Torus/Pool Cooling Mode									X			A3.01 Valve operation (69R)	3.3	1
226001 RHR/LPCI: CTMT Spray Mode			X									K3.01 Containment/drywell/...(64)	3.6	1
230000 RHR/LPCI: Torus/Pool Spray Mode														
239001 Main and Reheat Steam	X											K1.11 High pressure heater drains (38R)	2.5	1
245000 Main Turbine Gen. and Auxiliaries				X								K4.05 Turbine protection (34)	2.9	1
256000 Reactor Condensate				X								K4.11 Isolation of SJAE's on low ...(85R)	2.9	1
262001 AC Electrical Distribution				X								K4.06 Redundant power sources...(96)	3.6	1
262002 UPS (AC/DC)								X				A2.02 Over voltage (86R)	2.5	1
263000 DC Electrical Distribution						X						K6.01 AC electrical distribution (39R)	3.2	1
271000 Offgas											X	2.3.11 Ability to control radiation...(32)	2.7	1
272000 Radiation Monitoring		X										K2.05 Reactor building ventilation...(33)	2.6	1
286000 Fire Protection														
290001 Secondary CTMT						X						K6.01 Reactor building ventilation...(70R)	3.5	1
290003 Control Room HVAC														
300000 Instrument Air					X							K5.01 Air compressors (73R)	2.5	1
400000 Component Cooling Water										X		A4.01 CCW indications and controls (11)	3.1	1
K/A Category Point Totals:	2	1	2	3	2	2	2	1	1	2	1	Group Point Total:		19

ES-401

**BWR RO Examination Outline
Plant Systems - Tier 2/Group 3**

Form ES-401-2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts
215001 Traversing In-core Probe						X						K6.04 Primary containment isol...(36)	3.1	1
233000 Fuel Pool Cooling and Cleanup				X								K4.07 Supplemental heat removal...(35)	2.7	1
234000 Fuel Handling Equipment									X			A3.02 Interlock operation (31)	3.1	1
239003 MSIV Leakage Control														
268000 Radwaste														
288000 Plant Ventilation	X											K1.05 Process radiation monitor...(13)	3.3	1
290002 Reactor Vessel Internals														
K/A Category Point Totals:	1	0	0	1	0	1	0	0	1	0	0	Group Point Total:		4

Facility: Limerick Generating Station		Date of Exam: 03/31/2000		Exam Level: RO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.10	Knowledge of conditions/ limitations in the facility license (93)	2.7	1	
	2.1.2	Knowledge of operator responsibilities during all modes of plant operation (56R)	3.0	1	
	2.1.32	Ability to explain and apply system limits and precautions (8R)	3.4	1	
	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation (84)	3.7	1	
	Total			4	
Equipment Control	2.2.12	Knowledge of surveillance procedures (60R)	3.0	1	
	2.2.27	Knowledge of the refueling process (26R)	2.6	1	
	2.2.3	(Multi-unit) Knowledge of the design, procedural, and operational differences between units (14)	3.1	1	
	Total			3	
Radiation Control	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure (71)	2.9	1	
	2.3.9	Knowledge of the process for performing a containment purge (15)	2.5	1	
	Total			2	
Emergency Procedures and Plan	2.4.11	Knowledge of abnormal condition procedures (28R)	3.4	1	
	2.4.12	Knowledge of general operating crew responsibilities during emergency operations (16)	3.4	1	
	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions (68R)	3.9	1	
	2.4.1	Knowledge of EOP entry condition and immediate action...(72)	4.3	1	
	Total			4	
Tier 3 Point Total (RO)				13	

Facility: <u>Limerick Generating Station</u>		Date of Examination: 04/03/2000
Examination Level SRO		Operating Test Number: _____
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations	Actions for an incorrect Checkoff List (COL) step (OM-C-10.7)
		OPCON change requirements during Startup (GP-2)
		Discovery of a mispositioned Control Rod (ON-123)
		Working Hour Restrictions (A-C-40)
A.2	Equipment Control	Equipment Status Tag use (OM-L-10.1)
		Failed Surveillance Test (A-C-43)
A.3	Radiation Control	Emergency Dose Extension (HP-C-106)
		Locked High Rad Area Control (HP-C-215)
A.4	Emergency Plan	JPM: Classify the Emergency Action Level (EAL) (ERP-101)

Facility: <u>Limerick Generating Station</u>		Date of Examination: 04/03/2000
Examination Level RO		Operating Test Number: _____
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations	Temporary Relief (OM-C-6.2)
		License Qualification Maintenance (OM-L-5.5)
		JPM: Evaluate and Troubleshoot a faulty 3D Monicore P1 Edit (RE-C-20)
A.2	Equipment Control	Surveillance Test Grace Period (A-C-43)
		Troubleshooting Plant Equipment (TRT) (A-C-41)
A.3	Radiation Control	High Radiation Area (TS 6.12.1)
		Contamination Control (HP-C-818)
A.4	Emergency Plan	Alternate Emergency Facilities (ERP-200)
		Emergency Communicator (ERP-110)

Facility: Limerick Generating Station		Date of Examination: 04/03/2000	
Exam Level: SRO(U)		Operating Test No.: _____	
B.1 Control Room Systems			
System / JPM Title	Type Code*	Safety Function	
a. RCIC Start for Pressure Control	N, A, S	3	
b. Place Reactor Feed Pump in Service During Start-up	N, L, S	2	
c. Manual Depressuration of RHR	N, A, S	4	
d.			
e.			
f.			
g.			
B.2 Facility Walk-Through			
a. Bypass a Control Rod from RMCS	D, R	7	
b. Defeat HPCI/RCIC High Temperature Isolations (T-249)	D, R	5	
c.			
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA			

Facility: Limerick Generating Station		Date of Examination: 04/03/2000	
Exam Level: SRO(I)		Operating Test No.: _____	
B.1 Control Room Systems			
System / JPM Title	Type Code*	Safety Function	
a. SCRAM Reset	D, A, L, S	1	
b. RCIC Start for Pressure Control	N, A, S	3	
c. Place Reactor Feed Pump in Service During Start-up	N, L, S	2	
d. Venting Primary Containment from 2" Suppression Pool Vent	M, A, S	5	
e. Perform a Remote Manual Start of D12 Diesel Generator	D, S	6	
f. Alternate Cooling of RECW Heat Exchanger	D, S	8	
g. Manual Depressurization of RHR	N, A, S	4	
B.2 Facility Walk-Through			
a. Bypass Squib Valves for SLC Injection (T-212)	D, R	1	
b. Bypass a Control Rod from RMCS	D, R	7	
c. Defeat HPCI/RCIC High Temperature Isolations (T-249)	D, R	5	
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA			

Facility: Limerick Generating Station		Date of Examination: 04/03/2000	
Exam Level: RO		Operating Test No.: _____	
B.1 Control Room Systems			
System / JPM Title	Type Code*	Safety Function	
a. SCRAM Reset	D, A, L, S	1	
b. RCIC Start for Pressure Control	N, A, S	3	
c. Place Reactor Feed Pump in Service During Start-up	N, L, S	2	
d. Venting Primary Containment from 2" Suppression Pool Vent	M, A, S	5	
e. Perform a Remote Manual Start of D12 Diesel Generator	D, S	6	
f. Alternate Cooling of RECW Heat Exchanger	D, S	8	
g. Manual Depressurization of RHR	N, A, S	4	
B.2 Facility Walk-Through			
a. Bypass Squib Valves for SLC Injection (T-212)	D, R	1	
b. Bypass a Control Rod from RMCS	D, R	7	
c. Defeat HPCI/RCIC High Temperature Isolations (T-249)	D, R	5	
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA			