

Facility:		Date of Exam:																
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 & Abnormal Plant Evolutions	1	4	3	3	N/A			4	4	N/A			2	20			7	
	2	1	1	2				1	1				1	7			3	
	Tier Totals	5	4	5				5	5				3	27			10	
2. Plant Systems	1	2	1	1	5	3	3	2	3	3	1	2	26			5		
	2	0	1	1	1	1	2	1	1	1	1	2	12			3		
	Tier Totals	2	2	2	6	4	5	3	4	4	2	4	38			8		
3. Generic Knowledge and Abilities Categories				1		2		3		4		10		1	2	3	4	7
				3		2		2		3								
<p>Note:</p> <ol style="list-style-type: none"> 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/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 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. Refer to Section D.1.b of ES-401 for the applicable K/As. 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; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). 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. 																		

295028 High Drywell Temperature / 5		X					AK2.04: Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: Drywell ventilation	3.6 3.6	14
295030 Low Suppression Pool Wtr Lvl / 5					X		EA2.02: Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: Suppression pool temperature	3.9 3.9	15
295031 Reactor Low Water Level / 2		X					EK2.10: Knowledge of the interrelations between REACTOR LOW WATER LEVEL and Redundant Reactivity Control	4.0 4.0	16
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1			X				EK3.07: Knowledge of the reasons for the following responses as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Various alternate methods of control rod insertion	4.2 4.3	17
295038 High Off-site Release Rate / 9				X			EA1.01: Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE: Stack-gas monitoring system	3.9 4.2	18
600000 Plant Fire On Site / 8			X				AK3.04: Knowledge of the reasons for the following responses as they apply to PLANT FIRE ON SITE: Actions contained in the abnormal procedure for plant fire on site	2.8 3.4	19
700000 Generator Voltage and Electric Grid Disturbances / 6				X			AA1.03: Ability to operate and/or monitor voltage regulator controls as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES	3.8 3.7	20
K/A Category Totals:	4	3	3	4	4	2	Group Point Total:		20 /7

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K/A Category Point Totals:	1	1	2	1	1	1	Group Point Total:				7/3

ES-401		BWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / 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							X					A1.03: Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE controls including: System flow	3.8 3.7	28
205000 Shutdown Cooling				X								K4.03: Knowledge of SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) design feature(s) and/or interlocks which provide for low reactor water level	3.8 3.8	29
206000 HPCI		X						X				K2.01: Knowledge of the electrical power supplies to the following: System valves A2.01: Ability to (a) predict the impacts of the following on the HIGH PRESSURE COOLANT INJECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Turbine trips	3.2 3.3 4.0 4.0	30/31
207000 Isolation (Emergency) Condenser														
209001 LPCS				X								K4.08: Knowledge of LOW PRESSURE CORE SPRAY SYSTEM design feature(s) and/or interlocks which provide for the following: Automatic system initiation	3.8 4.0	32
209002 HPCS														
211000 SLC					X							K5.06: Knowledge of the operational implications of the following concepts as they apply to STANDBY LIQUID CONTROL SYSTEM: Tank level measurement	3.0 3.2	33
212000 RPS				X	X							K4.04: Ability to manually operate and/or monitor in the control room: Bypass SCRAM instrument volume high level SCRAM signal K5.02: Knowledge of the operational implications of specific logic arrangements as they apply to REACTOR PROTECTION SYSTEM	3.9 3.9 3.3 3.4	34/35
215003 IRM						X						K6.04: Knowledge of the effect that a loss or malfunction of the following will have on the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM: Detectors	3.0 3.0	36
215004 Source Range Monitor							X					AA1.05: Ability to predict and/or monitor changes in parameters associated with operating the SOURCE RANGE MONITOR (SRM) SYSTEM controls including: SCRAM, rod block, and period alarm trip setpoints	3.6 3.8	37

215005 APRM / LPRM				X								K4.01: Knowledge of AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM design feature(s) and/or interlocks which provide for the following: Rod withdrawal blocks	3.7 3.7	38
217000 RCIC						X		X				K6.01: Knowledge of the effect that a loss or malfunction of electrical power will have on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) A2.03: Ability to (a) predict the impacts of valve closures on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations	3.4 3.5 3.4 3.3	39/40
218000 ADS			X						X			K3.02: Knowledge of the effect that a loss or malfunction of the AUTOMATIC DEPRESSURIZATION SYSTEM will have on the following: Ability to rapidly depressurize the reactor A3.09: Ability to monitor automatic operations of the AUTOMATIC DEPRESSURIZATION SYSTEM including: Reactor vessel water level	4.5 4.6 4.2 4.3	41/42
223002 PCIS/Nuclear Steam Supply Shutoff								X				A2.09: 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: System initiation	3.6 3.9	43
239002 SRVs									X			A3.08: Ability to monitor automatic operations of the RELIEF/SAFETY VALVES including: Lights and alarms	3.6 3.6	44
259002 Reactor Water Level Control										X		G2.1.28: Reactor Water Level Control: Knowledge of the purpose and function of major system components and controls	4.1 4.1	45
261000 SGTS						X						K6.05: Knowledge of the effect that a loss or malfunction of the following will have on the STANDBY GAS TREATMENT SYSTEM: Reactor protection system: Plant-Specific	3.1 3.2	46
262001 AC Electrical Distribution	X											K1.01: Knowledge of the physical connections and/or cause effect relationships between A.C. ELECTRICAL DISTRIBUTION and the following: Emergency generators	3.8 4.3	47
262002 UPS (AC/DC)				X								K4.01: Knowledge of UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) design feature(s) and/or interlocks which provide for the following: Transfer from preferred power to alternate power supplies	3.1 3.4	48
263000 DC Electrical Distribution			X									K3.03: Knowledge of the effect that a loss or malfunction of the D.C. ELECTRICAL DISTRIBUTION will have on systems with D.C. components	3.4 3.8	49

264000 EDGs	X											X	K1.04: Knowledge of the physical connections and/or cause-effect relationships between EMERGENCY GENERATORS (DIESEL/JET) and the following: Emergency generator cooling water system G2.1.30: Ability to locate and operate components, including local controls, as they apply to Emergency Generators (Diesel/Jet).	3.2 3.3 4.4 4.0	50/51
300000 Instrument Air					X								K5.01: Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: Air compressors	2.5 2.5	52
400000 Component Cooling Water												X	A3.01: Ability to monitor automatic operations of the CCWS including: Setpoints on instrument signal levels for normal operations, warnings, and trips that are applicable to the CCWS	3.0 3.0	53
K/A Category Point Totals:	2	1	1	5	3	3	2	3	3	1	2	Group Point Total:			26/5

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Category	K/A #	Topic	RO	
			IR	#
1. Conduct of Operations	2.1.29	Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.	4.1/4.0	66
	2.1.1	Knowledge of conduct of operations requirements.	3.8/4.2	67
	2.1.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.	3.9/4.2	68
	Subtotal			3
2. Equipment Control	2.2.39	Knowledge of less than or equal to one hour Technical Specification action statements for systems.	3.9/4.5	69
	2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	4.5/4.4	70
	Subtotal			2
3. Radiation Control	2.3.11	Ability to control radiation releases	3.8/4.3	71
	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5/3.6	72
	Subtotal			2
4. Emergency Procedures / Plan	2.4.8	Knowledge of how abnormal operating procedures are used in conjunction with EOPs.	3.8/4.5	73
	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.5/4.7	74
	2.4.34	Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	4.2/4.1	75
	Subtotal			3
Tier 3 Point Total				10

Facility:		Date of Exam:															
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 & Abnormal Plant Evolutions	1												20	4	3	7	
	2											7	2	1	3		
	Tier Totals											27	6	4	10		
2. Plant Systems	1											26	2	3	5		
	2											12	0	1	3		
	Tier Totals											38	3	5	8		
3. Generic Knowledge and Abilities Categories						1	2	3	4	10			1	2	3	4	7
													2	2	1	2	

Note:

- 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).
- 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.
- 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/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
- 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.
- 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.
- Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
- * 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. Refer to Section D.1.b of ES-401 for the applicable K/As.
- 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; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
- 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
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / 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									
295004 Partial or Total Loss of DC Pwr / 6					X		AA2.03: Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: Battery voltage	2.9	76
295005 Main Turbine Generator Trip / 3									
295006 SCRAM / 1					X		AA2.03: Ability to determine and/or interpret the following as they apply to SCRAM: Reactor water level	4.2	77
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.	3.7	78
295021 Loss of Shutdown Cooling / 4									
295023 Refueling Acc / 8									
295024 High Drywell Pressure / 5						X	G2.4.18: Knowledge of specific bases for EOPs as they apply to High Drywell Pressure.	4.0	80
295025 High Reactor Pressure / 3									
295026 Suppression Pool High Water Temp. / 5									
295027 High Containment Temperature / 5									
295028 High Drywell Temperature / 5									
295030 Low Suppression Pool Wtr Lvl / 5									
295031 Reactor Low Water Level / 2					X		EA2.04: Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL: Adequate Core Cooling	4.8	81
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1						X	G2.4.6: Knowledge of EOP mitigation strategies as they apply to SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown.	4.7	82
295038 High Off-site Release Rate / 9						X	G2.4.31: Knowledge of annunciator alarms, indications, or response procedures. (High Off-site Release Rate)	4.1	79
600000 Plant Fire On Site / 8									
700000 Generator Voltage and Electric Grid Disturbances / 6									
K/A Category Totals:					4	3	Group Point Total:		20/7

ES-401

BWR Examination Outline
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / **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									
295011 High Containment Temp / 5									
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5					X		A2.01: Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL TEMPERATURE: Suppression Pool Temperature.	4.0	83
295014 Inadvertent Reactivity Addition / 1									
295015 Incomplete SCRAM / 1						X	G.2.4.41: Knowledge of the emergency action level thresholds and classifications.	3.6	84
295017 High Off-site Release Rate / 9					X		AA2.05: Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE: Meteorological data.	4.2	85
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									
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 Point Totals:					2	1	Group Point Total:		7/3

400000 Component Cooling Water																			
K/A Category Point Totals:									2				3	Group Point Total:					26/5

ES-401		BWR Examination Outline Plant Systems - Tier 2/Group 2 (RO / 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														
201005 RCIS														
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											X	G2.1.7: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation (RHR/LPCI: CTMT Spray Mode)	4.7	91
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.											X	G2.4.11: Knowledge of abnormal condition procedures as they relate to Main Turbine Generator and Auxiliary Systems	4.2	92
256000 Reactor Condensate														
259001 Reactor Feedwater								X				A2.07: Ability to (a) predict the impacts of the following on the REACTOR FEEDWATER SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Reactor water level control system malfunctions	3.8	93
268000 Radwaste														
271000 Offgas														
272000 Radiation Monitoring														
286000 Fire Protection														

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SRO OUTLINE

Category	K/A #	Topic	SRO	
			IR	#
1. Conduct of Operations	2.1.35	Knowledge of the fuel-handling responsibilities of SROs.	3.9	94
	2.1.32	Ability to explain and apply system limits and precautions.	4.0	95
	Subtotal			2
2. Equipment Control	2.2.17	Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator.	3.8	96
	2.2.5	Knowledge of the process for making changes in the facility as described in the safety analysis report.	3.2	97
	Subtotal			2
3. Radiation Control	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal or emergency conditions or activities.	3.8	98
	Subtotal			1
4. Emergency Procedures / Plan	2.4.16	Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.	4.4	99
	2.4.30	Knowledge of the emergency plan.	4.0	100
	Subtotal			2
Tier 3 Point Total				7

Facility: Limerick Examination Level: RO		Date of Examination: 10/8/12-10/12/12 Operating Test Number: 1
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A-1.1	R, N	Evaluate Overtime Work Request
Conduct of Operations A-1.2	R, N	Review of Drywell Floor Drain/Equipment Drain Tank Surveillance Logs
Equipment Control A-2	R, N	Blocking of equipment
Radiation Control A-3	N/A	N/A
Emergency Procedures/Plan A-4	R, N	EAL Callout
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Facility: Limerick Examination Level: SRO-I		Date of Examination: 10/8/12-10/12/12 Operating Test Number: 1
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A-1.1	R, N	Evaluation of Overtime Hours to Determine Availability
Conduct of Operations A-1.2	R, N	Review of Drywell Floor Drain/Equipment Drain Tank Surveillance Logs
Equipment Control A-2	R, N	Blocking of equipment
Radiation Control A-3	R, N	Review inventory release from Equipment Drain Sample Tanks to Cooling Tower Blowdown Line.
Emergency Procedures/Plan A-4	R,N	EAL Call
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Facility: Limerick Date of Examination: 10/9/12
 Exam Level: RO ☒ SRO-I ☐ SRO-U ☐ Operating Test No.: 1

Control Room Systems[@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
a. Recirculation Pump System/Start Up 1A Recirc Pump	A, N, S	1
b. Manually Start HPCI	A, EN, N, S	2
c. Main Turbine Bypass Valve Exercising	D, S	3
d. SDC Operations	A, L, N, S	4
e. EDG Operations	A, E, N	6
f. Scram Channel A1 and A2 Functional Test	A, M, S	7
g. Restore RECW, DWCW, and Instrument Gas	D, S	8
h. Standby Gas Treatment Manual Startup with Charcoal Enclosure Hi Temp	A, M, S	9

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

i. Maximize CRD Flow After Shutdown During Emergency Conditions (T-240) Unit 2	E, L, N, R	1
j. Alignment of Equipment for Manual Operation of LPCI	A, N, R	2
k. Venting Primary Containment Using the 6" ILRT Line from the Drywell	E, N	5

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / ≥ 1 (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

* ONLY ONE OUTLINE INITIALLY produced for Crew RO/SRO-I/SRO-U. The decision was made AFTER EXAM VALIDATION WHICH of the JPMs would be administered to the SRO-I/SRO-U & WHICH would be RO ONLY J. CARUSO

Facility: Limerick

Scenario No.: 1

Op-Test No.: _____

Examiners: _____

Operators: _____

Initial Conditions: Unit 1 at 90% power to recover HCU maintenance rods, D11 EDG out of service for overhaul, day 2 of 30 day LCO

Turnover: Recover the HCU maintenance rods and return Unit 1 to 100% power

Event No.	Malf. No.	Event Type*	Event Description
1		R-ATC	Raise power by control rod withdrawal
2	MPR011B	I-ATC, TS-SRO	1B RBM Fails Inop
3	MMC077B	C-BOP	Hotwell level controller failure
4	MRD016A, MRD016B	C-ATC TS-SRO	Control rod ____ drifts out
5	MED015D	C-BOP, C-ATC	Closure failure of 101-D12/Temporary loss of D124-G-D Load Center/Temporary loss of ability to drive control rods
6	MSL001A, MCU195A	C-ATC, TS-SRO	SLC spurious injection with RWCU isolation failure
7	MRP029C, MRP407C, MSL559	M-ALL C-ATC C-BOP	Electric ATWS/RRCS failure/SLC header rupture
8	MMT002, MCR412A, MEH108	C-ATC	T-221 failure, main turbine trip, bypass valve closure, running CRD pump trips
9	MSW492A-D	C-BOP	RHRSW Pump Trip in Suppression Pool Cooling
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: Limerick

Scenario No.: 2

Op-Test No.: _____

Examiners: _____

Operators: _____

Initial Conditions: 100% power following a rod pattern adjustment, MOL, D11 Diesel out of service to repair a Jacket Water System leak (48 hours into a 30 day LCO - 3.8.1, AC Sources Operating); repairs expected to be completed within the next 24 hours

Turnover: Maintain power with Recirc to compensate for Xenon

Event No.	Malf. No.	Event Type*	Event Description
1	MPR017A	I-ATC TS-SRO	'A' Recirc Flow Unit fails downscale
2	MFH564B	C-BOP R-ATC	FWH 12B Level Sensing Line Fails High (Reduce Power \leq 85%)
3	MEH105C	C-ATC TS-SRO	EHC Pressure Regulator 'A' Fails (Oscillates)
4	MRD016D XXXXXXX	C-ATC C-BOP TS-SRO	'1A' Recirc Pump Motor Bearing Temperatures Exceed 200 °F Requiring Pump Trip / Results in Single Loop Operation in Restricted Region of Power/Flow Map / Stuck Control Rod 30-31 During Insertion IAW Reactor Maneuvering Shutdown Instructions (RMSI)
5	MED282B	C-ATC C-BOP TS-SRO	Loss of 125/250 VDC Safeguard Bus 1BD105
6	MED261	M-All	Grid Instability Resulting in Loss of Offsite Power
7	MDG420C	C-ATC	D13 Diesel Auto Start Failure (Recoverable)
8	MRR440A MDG418D	M-All	Small Break LOCA (0.5% to 1% ramp over 5 minutes) with D14 Diesel Trip on Bus Lockout
9	MRC466	C-BOP	RCIC Trip on Overspeed (Recoverable after RPV Level reaches -129")
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: Limerick

Scenario No.: 4

Op-Test No.: _____

Examiners: _____

Operators: _____

Initial Conditions: 100% power, ST-6-092-314-1, "D14 Diesel Generator Slow Start Operability Test Run," in progress

Turnover: D14 D/G has been running at full load for 2 hours. ST-6-092-314-1 is completed up to and including step 4.12.3. The crew is directed to shutdown D14 D/G starting at step 4.12.4

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-BOP	Shutdown D14 D/G IAW ST-6-092-314-1
2	MVI232F MRP029A	I-ATC TS-SRO	Rx Level Transmitter LT-42-1N080C Fails Low with No RPS Actuation Signal
3	VIC105A6	R-ATC TS-SRO	'1A' Recirc Pump Motor High Vibration (Power Reduced to $\leq 93\%$ to Clear Annunciator 111 D2)
4	MCU194	C-BOP TS-SRO	RWCU Leak with Auto Isolation Failure (Manual Isolation Successful)
5	MEG095	C-BOP	Main Generator Voltage Regulator Failure with Volts/Hertz Exceeding Alarm Setpoint
6	XXXXXX	C-ATC TS-SRO	'1A' Recirc Pump ASD Controller Fails Upscale
7	MMS069	C-BOP R-ATC TS-SRO	Steam Seal Evaporator Steam Outlet Valve Fails Closed
8	MED275C	C-BOP TS-SRO	OBE Earthquake with Loss of Safeguard Bus D134 (Loss of 1A Instrument Air Compressor / 'Loss of Secondary Containment')
9	MRT001B MMS061A MMS062A MMS136	M-ALL	Main Steam Line High High Radiation (Fuel Failure) / MSL Break in Outboard MSIV Room (Rooms 407 and 518) with Failure of the 'A' Main Steam Line to Isolate
10	MRE001A MRE001B MRE317 RRE013	C-ATC	SGTS Exhaust Fan 0A(B)V163 Trip with Failure to Start of the STBY SGTS Exhaust Fan 0B(A)V163 (Recoverable) / Leak Propagation
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			