

Facility: Limerick Generating Station

Printed: 10/30/2006

Date Of Exam: 10/23/2006

Tier	Group	RO K/A Category Points												SRO-Only Points					
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	K	A	A2	G*	Total	
1. Emergency & Abnormal Plant Evolutions	1	3	4	3	N/A			4	4	N/A			2	20	0	0	0	0	0
	2	1	1	1	N/A			1	2	N/A			1	7	0	0	0	0	0
	Tier Totals	4	5	4	N/A			5	6	N/A			3	27	0	0	0	0	0
2. Plant Systems	1	2	2	2	3	2	3	2	3	2	3	2	26	0	0	0	0	0	
	2	1	1	1	2	1	1	1	1	1	1	1	12	0	0	0	0	0	
	Tier Totals	3	3	3	5	3	4	3	4	3	4	3	38	0	0	0	0	0	
3. Generic Knowledge And Abilities Categories					1		2		3		4		10	1	2	3	4	0	
					3		3		2		2			0	0	0	0		

Note:

1. Ensure that at least two topics from every 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.

Note: This form deviates from the NUREG-1021 Form ES-401-1 by the addition of the K and A column under the SRO Only Points. This allows sampling all Fuel Handling System KAs as required by ES-401.

BWR RO Examination Outline

Printed: 10/30/2006

Facility: Limerick Generating Station

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1 (RO / SRO)

Form ES-401-1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4	X						AK1.01 - Natural circulation	3.5	1
295003 Partial or Complete Loss of AC Pwr / 6					X		AA2.04 - System lineups	3.5	1
295004 Partial or Complete Loss of DC Pwr / 6				X			AA1.02 - Systems necessary to assure safe plant shutdown	3.8	1
295005 Main Turbine Generator Trip / 3			X				AK3.01 - Reactor scram	3.8	1
295006 SCRAM / 1					X		AA2.02 - Control rod position	4.3*	1
295016 Control Room Abandonment / 7						X	2.1.25 - Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.	2.8	1
295016 Control Room Abandonment / 7		X					AK2.01 - Remote shutdown panel: Plant-Specific	4.4*	1
295018 Partial or Total Loss of CCW / 8				X			AA1.01 - Backup systems	3.3	1
295019 Partial or Total Loss of Instrument Air / 8			X				AK3.01 - Backup air system supply: Plant-Specific	3.3	1
295021 Loss of Shutdown Cooling / 4				X			AA1.04 - Alternate heat removal methods	3.7	1
295023 Refueling Acc / 8						X	2.2.28 - Knowledge of new and spent fuel movement procedures.	2.6	1
295024 High Drywell Pressure / 5				X			EA1.04 - RHR/LPCI	4.1	1
295025 High Reactor Pressure / 3	X						EK1.05 - †Exceeding safety limits	4.4*	1
295026 Suppression Pool High Water Temp. / 5					X		EA2.03 - Reactor pressure	3.9	1
295028 High Drywell Temperature / 5		X					EK2.04 - Drywell ventilation	3.6	1
295030 Low Suppression Pool Wtr Lvl / 5			X				EK3.02 - HPCI operation: Plant-Specific	3.5	1
295031 Reactor Low Water Level / 2	X						EK1.01 - Adequate core cooling.	4.6*	1
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1		X					EK2.09 - Reactor water level	4.0	1
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1					X		EA2.05 - Control rod position	4.2*	1
295038 High Off-Site Release Rate / 9		X					EK2.03 - Plant ventilation systems	3.6	1
K/A Category Totals:	3	4	3	4	4	2	Group Point Total:	20	

BWR RO Examination Outline

Printed: 10/30/2006

Facility: Limerick Generating Station

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2 (RO / SRO)

Form ES-401-1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3		X					AK2.11 - Seal steam: Plant-Specific	2.6	1
295007 High Reactor Pressure / 3				X			AA1.05 - Reactor/turbine pressure regulating system	3.7	1
295010 High Drywell Pressure / 5			X				AK3.02 - Increased drywell cooling	3.4	1
295015 Incomplete SCRAM / 1					X		AA2.01 - Reactor power	4.1*	1
295020 Inadvertent Cont. Isolation / 5 & 7	X						AK1.05 - Loss of drywell/containment cooling	3.3	1
295033 High Secondary Containment Area Radiation Levels / 9						X	2.1.23 - Ability to perform specific system and integrated plant procedures during different modes of plant operation.	3.9	1
500000 High CTMT Hydrogen Conc. / 5					X		EA2.03 - Combustible limits for drywell	3.3	1
K/A Category Totals:	1	1	1	1	2	1	Group Point Total:	7	

BWR RO Examination Outline

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Facility: Limerick Generating Station

ES - 401

Plant Systems - Tier 2 / Group 1 (RO / SRO)

Form ES-401-1

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	IR	#
203000 RHR/LPCI: Injection Mode						X						K6.02 - D.C. electrical power	2.8*	1
205000 Shutdown Cooling						X						K6.04 - Reactor water level	3.6	1
206000 HPCI							X					A1.09 - Turbine speed: BWR-2, 3, 4	3.5	1
209001 LPCS			X									K3.02 - ADS logic	3.8	1
209001 LPCS											X	2.1.30 - Ability to locate and operate components, including local controls.	3.9	1
211000 SLC							X					A1.10 - Lights and alarms	3.7	1
212000 RPS				X								K4.12 - Bypassing of selected SCRAM signals (manually and automatically): Plant-Specific	3.9	1
212000 RPS										X		A4.16 - Manually activate anticipated transient without SCRAM circuitry/RRCS: Plant-Specific	4.4*	1
215003 IRM		X										K2.01 - IRM channels/detectors	2.5*	1
215004 Source Range Monitor					X							K5.03 - Changing detector position	2.8	1
215005 APRM/LPRM	X											K1.03 - RBM: Plant-Specific	3.4	1
217000 RCIC								X				A2.05 - D.C. power loss	3.3	1
217000 RCIC										X		A4.04 - Manually initiated controls	3.6	1
218000 ADS									X			A3.01 - ADS valve operation	4.2*	1
223002 PCIS/Nuclear Steam Supply Shutoff								X				A2.05 - Nuclear boiler instrumentation failures	3.3	1
239002 SRVs				X								K4.05 - Allows for SRV operation from more than one location: Plant-Specific	3.6	1
259002 Reactor Water Level Control					X							K5.01 - GEMAC/Foxboro/Bailey controller operation: Plant-Specific	3.1	1
261000 SGTS						X						K6.08 - Reactor vessel level: Plant-Specific	3.1	1
262001 AC Electrical Distribution								X				A2.02 - Loss of coolant accident	3.6	1
262002 UPS (AC/DC)			X									K3.15 - Main turbine operation: Plant-Specific	2.6	1

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ES - 401

Plant Systems - Tier 2 / Group 1 (RO / SRO)

Form ES-401-1

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	IR	#
263000 DC Electrical Distribution		X										K2.01 - Major D.C. loads	3.1	1
263000 DC Electrical Distribution											X	2.4.31 - Knowledge of annunciators alarms and indications, and use of the response instructions.	3.3	1
264000 EDGs										X		A4.01 - Adjustment of exciter voltage	3.3	1
264000 EDGs									X			A3.03 - Indicating lights, meters, and recorders	3.4	1
300000 Instrument Air	X											K1.03 - Containment air	2.8	1
400000 Component Cooling Water				X								K4.01 - Automatic start of standby pump	3.4	1
K/A Category Totals:	2	2	2	3	2	3	2	3	2	3	2	Group Point Total:		26

BWR RO Examination Outline

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Facility: Limerick Generating Station

ES - 401

Plant Systems - Tier 2 / Group 2 (RO / SRO)

Form ES-401-1

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	IR	#
201002 RMCS			X									K3.02 - †Rod block monitor: Plant-Specific	2.9	1
201006 RWM				X								K4.06 - Correction of out of sequence rod positions: P-Spec(Not-BWR6)	3.2	1
202001 Recirculation								X				A2.17 - Loss of seal cooling water	3.1	1
204000 RWCU									X			A3.03 - Response to system isolations	3.6	1
215002 RBM		X										K2.03 - APRM channels: BWR-3, 4, 5	2.8	1
216000 Nuclear Boiler Inst.											X	2.4.50 - Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	1
223001 Primary CTMT and Aux.					X							K5.01 - Vacuum breaker/relief operation	3.1	1
230000 RHR/LPCI: Torus/Pool Spray Mode										X		A4.02 - Spray valves	3.8	1
245000 Main Turbine Generator/Aux							X					A1.01 - Generator megawatts	2.7	1
256000 Reactor Condensate	X											K1.02 - Reactor feedwater system	3.3	1
259001 Reactor Feedwater						X						K6.07 - Reactor water level control system	3.8	1
290003 Control Room HVAC				X								K4.01 - System initiations/reconfiguration: Plant-Specific	3.1	1
K/A Category Totals:	1	1	1	2	1	1	1	1	1	1	1	Group Point Total:	12	

Generic Knowledge and Abilities Outline (Tier 3)

BWR RO Examination Outline

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Facility: Limerick Generating Station

Form ES-401-3

<u>Category</u>	<u>KA #</u>	<u>Topic</u>	<u>IR</u>	<u>#</u>
Conduct of Operations	2.1.3	Knowledge of shift turnover practices.	3.0	1
	2.1.19	Ability to use plant computer to obtain and evaluate parametric information on system or component status.	3.0	1
	2.1.28	Knowledge of the purpose and function of major system components and controls.	3.2	1
	Category Total:			3
Equipment Control	2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	3.7	1
	2.2.11	Knowledge of the process for controlling temporary changes.	2.5	1
	2.2.13	Knowledge of tagging and clearance procedures.	3.6	1
	Category Total:			3
Radiation Control	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1
	2.3.11	Ability to control radiation releases.	2.7	1
	Category Total:			2
Emergency Plan	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including: 1.Reactivity control 2.Core cooling and heat removal 3.Reactor coolant system integrity 4.Containment conditions 5.Radioactivity release control.	3.7	1
	2.4.46	Ability to verify that the alarms are consistent with the plant conditions.	3.5	1
	Category Total:			2
Generic Total:				10

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Tier	Group	RO K/A Category Points											SRO-Only Points									
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	K	A	A2	G*	Total				
1. Emergency & Abnormal Plant Evolutions	1	0	0	0	N/A			0	0	N/A			0	0	0	0	4	3	7			
	2	0	0	0				0	0				0	0	0	0	0	0	0	2	1	3
	Tier Totals	0	0	0				0	0				0	0	0	0	0	0	0	0	0	6
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5				
	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3				
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3	8				
3. Generic Knowledge And Abilities Categories				1		2		3		4		0		1	2	3	4	7				
				0		0		0		0				2	2	1	2					

Note:

1. Ensure that at least two topics from every 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.

Note: This form deviates from the NUREG-1021 Form ES-401-1 by the addition of the K and A column under the SRO Only Points. This allows sampling all Fuel Handling System KAs as required by ES-401.

BWR SRO Examination Outline

Printed: 10/30/2006

Facility: Limerick Generating Station

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1 (RO / SRO)

Form ES-401-1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					X		AA2.01 - Power/flow map	3.8	1
295003 Partial or Complete Loss of AC Pwr / 6					X		AA2.02 - Reactor power, pressure, and level	4.3*	1
295016 Control Room Abandonment / 7						X	2.3.1 - Knowledge of 10 CFR 20 and related facility radiation control requirements.	3.0	1
295021 Loss of Shutdown Cooling / 4					X		AA2.06 - Reactor pressure	3.3	1
295024 High Drywell Pressure / 5					X		EA2.04 - Suppression chamber pressure: Plant-Specific	3.9	1
295031 Reactor Low Water Level / 2						X	2.4.6 - Knowledge symptom based EOP mitigation strategies.	4.0	1
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1						X	2.1.20 - Ability to execute procedure steps.	4.2	1
K/A Category Totals:	0	0	0	0	4	3	Group Point Total:	7	

BWR SRO Examination Outline

Printed: 10/30/2006

Facility: Limerick Generating Station

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2 (RO / SRO)

Form ES-401-1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3					X		AA2.01 - Condenser vacuum/absolute pressure	3.1	1
295013 High Suppression Pool Temp. / 5						X	2.2.25 - Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
295032 High Secondary Containment Area Temperature / 5					X		EA2.02 - Equipment operability	3.5	1
K/A Category Totals:	0	0	0	0	2	1	Group Point Total:	3	

BWR SRO Examination Outline

Printed: 10/30/2006

Facility: Limerick Generating Station

ES - 401

Plant Systems - Tier 2 / Group 1 (RO / SRO)

Form ES-401-1

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	IR	#
206000 HPCI											X	2.1.12 - Ability to apply technical specifications for a system.	4.0	1
217000 RCIC								X				A2.10 - Turbine control system failures	3.1	1
223002 PCIS/Nuclear Steam Supply Shutoff								X				A2.08 - †Surveillance testing	3.1	1
259002 Reactor Water Level Control								X				A2.03 - Loss of reactor water level input	3.7	1
264000 EDGs											X	2.2.22 - Knowledge of limiting conditions for operations and safety limits.	4.1	1
K/A Category Totals:	0	0	0	0	0	0	0	3	0	0	2	Group Point Total:	5	

BWR SRO Examination Outline

Printed: 10/30/2006

Facility: Limerick Generating Station

ES - 401

Plant Systems - Tier 2 / Group 2 (RO / SRO)

Form ES-401-1

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	IR	#
201002 RMCS											X	2.1.32 - Ability to explain and apply system limits and precautions.	3.8	1
241000 Reactor/Turbine Pressure Regulator								X				A2.04 - Failed open/closed control/governor valve(s)	3.8	1
290003 Control Room HVAC								X				A2.01 - Initiation/reconfiguration	3.2	1
K/A Category Totals:	0	0	0	0	0	0	0	2	0	0	1	Group Point Total:	3	

Generic Knowledge and Abilities Outline (Tier 3)

BWR SRO Examination Outline

Printed: 10/30/2006

Facility: Limerick Generating Station

Form ES-401-3

<u>Category</u>	<u>KA #</u>	<u>Topic</u>	<u>IR</u>	<u>#</u>
Conduct of Operations	2.1.4	Knowledge of shift staffing requirements.	3.4	1
	2.1.34	Ability to maintain primary and secondary plant chemistry within allowable limits.	2.9	1
	Category Total:			2
Equipment Control	2.2.6	Knowledge of the process for making changes in procedures as described in the safety analysis report.	3.3	1
	2.2.28	Knowledge of new and spent fuel movement procedures.	3.5	1
	Category Total:			2
Radiation Control	2.3.9	Knowledge of the process for performing a containment purge.	3.4	1
	Category Total:			1
Emergency Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps.	4.6	1
	2.4.6	Knowledge symptom based EOP mitigation strategies.	4.0	1
	Category Total:			2

Generic Total: 7

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO EXAM		
1/1	295016 2.2.25	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.
1/1	295023 2.1.27	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.
1/1	295031 EA2.01	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.
1/1	295038 EK1.03	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator and K/A corresponds to a task that is N/A for RO's.
1/1	600000 2.4.6	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator and generic K/A refers to EOP mitigation strategy, while the category is an AOP.
1/2	295007 AA1.04	Redrawn with the approval of the lead examiner due to K/A overlap with another K/A already included on this portion of the exam.
1/2	295033 2.1.23	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.
2/1	203000 K6.08	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator. Also a loss of ECS room cooling has no effect on LPCI because LGS is analyzed for loss of room cooling.
2/1	212000 A4.14	Redrawn with the approval of the lead examiner due to K/A overlap with a JPM.
2/1	261000 K6.01	Redrawn with the approval of the lead examiner due this K/A is a duplicate from 2005 ILT Exam (Q375215). Substituted another K6 in its place.
2/1	262002 K3.07	Redrawn with the approval of the lead examiner due to this K/A is essentially the same as another already on the exam.(215002 K2.03 RBM, electrical power supplies to APRM channels). Substituted another K3 in its place.
2/2	234000 A3.02	Redrawn with the approval of the lead examiner due to A3 not applicable to SRO exam, deselected due to a known deficiency in the software.
3	2.1.28	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.

SRO EXAM		
1/1	295030 EA2.02	Redrawn with the approval of the lead examiner due to K/A overlap with questions on the RO portion of the exam.
1/1	295031 2.1.6	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.
1/1	295005 AA2.08	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.
1/1	295024 2.1.23	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.
1/2	295007 2.2.25	Redrawn with the approval of the lead examiner due to K/A overlap with questions on the RO portion of the exam.
2/1	218000 A2.05	Redrawn with the approval of the lead examiner due to K/A overlap with questions on the RO portion of the exam.
2/1	223002 A2.05	Redrawn with the approval of the lead examiner due to K/A overlap with questions on the RO portion of the exam.
2/1	295002 A2.02	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.
2/2	219000 A2.05	Redrawn with the approval of the lead examiner due to K/A overlap with questions on the RO portion of the exam.
2/2	290003 A2.02	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.
3	2.4.32	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.
3	2.4.41	Redrawn with the approval of the lead examiner due the lack of concepts that would meet the K/A and still distinguish between a competent and non-competent operator.

Facility: <u>Limerick</u>		Date of Examination: <u>10/23/06</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>ILT05-1</u>
Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Determination of Adequate Shift Staffing
Conduct of Operations		
Equipment Control	N, R	Review Main Turbine Bypass Valve Exercising ST
Radiation Control	N, R	Calculate Stay Time
Emergency Plan	N, R	Fire Alarm in Invertor Room (CE 254')
<p>NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.</p>		
<p>* Type Codes & Criteria:</p> <ul style="list-style-type: none"> (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: <u>Limerick</u>		Date of Examination: <u>10/23/06</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>		Operating Test Number: <u>LT05-1</u>
Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Determination of Adequate Shift Staffing
Conduct of Operations	N, R	Administrative Actions on a Thermal Limit Violation
Equipment Control	N, R	Review Main Turbine Bypass Valve Exercising S.T.
Radiation Control	N, R	Calculate Stay Time
Emergency Plan	D, S	ERP Classification and Reporting (LOCA)
<p>NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.</p>		
<p>* Type Codes & Criteria:</p> <ul style="list-style-type: none"> (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
 Exam Level: RO SRO-I SRO-U

Date of Examination: 10/23/06
 Operating Test Number: ILT05-1

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. Reactor Recirc/Start MG Set - High Vibration	A, L, P, S	1
b. Shutdown "1C" Reactor Feed Pump From Standby Condition	A, N, S	2
c. Manually Initiate a Control Room Ventilation Radiation Isolation	P, S	9
d. Manually Initiate Core Spray ("D" Core Spray Pump fails to start)	A, N, S	4
e. Restore RECW, DWCW, PCIG	D, S	5
f. DG Fast Start From Control Room (Jacket Water High Temp)	A, N, S	6
g. Scram Reset	A, D, S	7
h. Placing Alternate RECW Pump in Service	A, N, S	8

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

i. Start "0B" ESW Pump From D12 SG (SE-6)	D, E, R	8
j. Place Alternate CRD Flow Control Valve In Service	D, L, R	1
k. MSIV -129" Bypass (T-221)	D, E, R	4

[@] 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	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Facility: <u>Limerick</u>		Date of Examination: <u>10/23/06</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test Number: <u>ILT05-1</u>
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. Reactor Recirc/Start MG Set - High Vibration	A, L, P, S	1
b. Shutdown "1C" Reactor Feed Pump From Standby Condition	A, N, S	2
c. Manually Initiate a Control Room Ventilation Radiation Isolation	P, S	9
d. Manually Initiate Core Spray ("D" Core Spray Pump fails to start)	A, N, S	4
e. DG Fast Start From Control Room (Jacket Water High Temp)	A, N, S	6
f. Scram Reset	A, D, S	7
g. Placing Alternate RECW Pump in Service	A, N, S	8
h.		
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Start "0B" ESW Pump From D12 SG (SE-6)	D, E, R	8
j. Place Alternate CRD Flow Control Valve In Service	D, L, R	1
k. MSIV -129" Bypass (T-221)	D, E, R	4
<p>[@] 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.</p>		
*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	≤ 9 / ≤ 8 / ≤ 4	
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1	
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	
(R)CA	≥ 1 / ≥ 1 / ≥ 1	
(S)imulator		

Facility: <u>Limerick</u>		Date of Examination: <u>10/23/06</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>		Operating Test Number: <u>ILT05-1</u>
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. Reactor Recirc/Start MG Set - High Vibration	A, L, P, S	1
b. DG Fast Start From Control Room (Jacket Water High Temp)	A, N, S (ESF)	6
c. Restore RECW, DWCW, PCIG	D, S	5
d.		
e.		
f.		
g.		
h.		
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Start "0B" ESW Pump From D12 SG (SE-6)	D, E, R	8
j. MSIV -129" Bypass (T-221)	D, E, R	4
k.		
<p>[@] 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.</p>		
*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	≤ 9 / ≤ 8 / ≤ 4	
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1	
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	
(R)CA	≥ 1 / ≥ 1 / ≥ 1	
(S)imulator		

Facility: LimerickScenario No.: 1Op-Test No.: ILT05-1Examiners: _____

_____Operators: _____

Initial Conditions: 100% power. RCIC is out of service for bearing replacement. Regulatory actions log entry has been made. Estimated time of repair is 24 hours.

Turnover: Maintain 100% power. Continue repairs on RCIC.

The crew is to perform ST-6-047-200-1, SDV Valve Exercise Test.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (ALL)	Perform ST-6-047-200-1, SDV Valve Exercise Test
2	MNS160A	I (PRO/CRS)	Inadvertent isolation of PCIG (TS)
3	MFW245C	C (RO/CRS) R (PRO)	RFP "B" high vibration, power reduction, remove "B" RFP from service.
4	MED263D	C (ALL)	D14 bus overcurrent/loss of D14 bus (TS), loss of "B" CRD pump and "B" drywell chiller.
5	MAD147E	C (ALL)	SRV "L" fails open mechanically
6	MRR441 MFW252B	M (ALL)	Coolant leakage / "B" Feedwater line rupture inside Primary Containment
7	MHP448B	C (PRO/CRS)	HPCI speed/flow controller fails low in AUTO with subsequent HPCI turbine trip

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: LimerickScenario No.: 2Op-Test No.: ILT05-1

Examiners: _____

Operators: _____

Initial Conditions: 95% power recovering from a planned down power to perform a minor rod pattern adjustment.

Turnover: 95% power. The minor rod pattern adjustment is complete. Raise power to 100% using GP-5, Appendix 2, and OP-AB-300-1003 without RE presence in the MCR.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (PRO)	Raise power to 100% with recirc.
2	MVI234A	I (RO/CRS)	"A" RPV Pressure Transmitter (RPS) fails high (TS).
3	RCW219 MCU002B	C (PRO/CRS)	RECW valve to RWCU non-regen heat exchanger closes. RWCU outboard isolation valve does not automatically isolate on high demin. inlet temp.
4	MRR435B	C (PRO/ CRS) R (RO)	"1B" Recirc Pump trips (TS) Insert control rods to exit Restricted Region
5	MRR435A MRP029D MRP407C	M (ALL)	"1A" Recirc Pump trips / ATWS – "B" RPS fails to trip, both RRCS channels fail to initiate ARI
6	MSL559	C (RO/CRS)	SLC pipe rupture in drywell
7	MEH108 MEH104B	C (PRO/CRS)	Main turbine bypass valves fail closed EHC load set runs back to minimum

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: Limerick Scenario No.: 3 Op-Test No.: ILT05-1

Examiners: _____ Operators: _____

Initial Conditions: 5% power with startup in progress. "1A" SRM is inoperable and bypassed.

Turnover: 5% power – Continue with the startup / heatup at step 3.3.29 of GP-2.
 Start the "1C" condensate pump for PMT per S05.1.B.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (PRO)	Start the "1C" condensate pump for PMT
2	N/A	R (RO)	Continue to withdraw control rods
3	MSR214F	I (RO/CRS)	IRM channel "F" fails upscale (TS)
4	E51-S37-PB	C (CRS)	RCIC inadvertent start and RPV injection (TS)
5	VIC114A	C (RO/CRS)	"1A" CRD Pump high vibration
6	MRR441 MMS067	M (ALL)	Small coolant leak followed by a large steam leak in the drywell
7	MRP029C	C (RO/CRS)	"A" RPS failure to scram
8	MRH171A MRH574A	C (PRO/CRS)	"A" RHR pump trips on start signal HV51-1F024B fails due to thermal overload
9	MRH171B	C (ALL)	"B" RHR pump trips when attempting to spray the drywell / must spray drywell with RHRSW.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor