

Facility:		ILT Class 08-01 NRC										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 & Plant Evolutions	1	5	2	3				4	3			3	20	4	3	7		
	2	2	1	1				1	1			1	7	1	2	3		
	Tier Totals	7	3	4				5	4			4	27	5	5	10		
2. Plant Systems	1	2	2	2	3	2	3	2	2	2	3	3	26	3	2	5		
	2	2	1	1	2	1	1	0	1	1	1	1	12	0	1	3		
	Tier Totals	4	3	3	5	3	4	2	3	3	4	4	38	4	4	8		
3. Generic Knowledge & Abilities Categories					1		2		3		4		10	1	2	3	4	7
					2		3		2		3			2	2	2	1	
<p>Note:</p> <ol style="list-style-type: none"> <li>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).</li> <li>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.</li> <li>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 section D.1.b of ES-401, for guidance regarding elimination of inappropriate K/A statements.</li> <li>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.</li> <li>Absent a plant specific priority, only those KAs 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.</li> <li>Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.</li> <li>* 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/A's</li> <li>On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) 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.</li> <li>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 10CFR55.43</li> </ol>																		

ILT Class 08-01 NRC  
Written Examination Outline  
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295003 Partial or Complete Loss of AC / 6					X		AA2.03 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : Battery status: Plant-Specific	3.5	76
295030 Low Suppression Pool Water Level / 5					X		EA2.01 - Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL : Suppression pool level	4.2	77
295005 Main Turbine Generator Trip / 3					X		AA2.04 - Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP : Reactor pressure	3.8	78
295023 Refueling Acc Cooling Mode / 8						X	2.2.37 - Equipment Control: Ability to determine operability and / or availability of safety related equipment.	4.6	79
295021 Loss of Shutdown Cooling / 4						X	2.2.37 - Equipment Control: Ability to determine operability and / or availability of safety related equipment.	4.6	80
295004 Partial or Total Loss of DC Pwr / 6						X	2.2.44 - Equipment Control: Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives effect plant and system conditions.	4.4	81
295006 SCRAM / 1					X		AA2.01 - Ability to determine and/or interpret the following as they apply to SCRAM : Reactor power	4.6	82
295005 Main Turbine Generator Trip / 3	X						AK1.03 - Knowledge of the operational implications of the following concepts as they apply to MAIN TURBINE GENERATOR TRIP : Pressure effects on reactor level	3.5	39
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1	X						EK1.01 - Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Reactor pressure effects on reactor power	4.1	40
295026 Suppression Pool High Water Temp. / 5	X						EK1.01 - Knowledge of the operational implications of the following concepts as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE : Pump NPSH	3.0	41
295018 Partial or Total Loss of CCW / 8		X					AK2.02 - Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER and the following: Plant operations	3.4	42
295025 High Reactor Pressure / 3	X						EK1.05 - Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE : Exceeding safety limits	4.4	43
295031 Reactor Low Water Level / 2		X					EK2.02 - Knowledge of the interrelations between REACTOR LOW WATER LEVEL and the following: Reactor pressure	3.8	44
295016 Control Room Abandonment / 7			X				AK3.01 - Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT : Reactor SCRAM	4.1	45

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EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295005 Main Turbine Generator Trip / 3			X				AK3.02 - Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: Recirculation pump downshift/trip: Plant-Specific	3.4	46
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4			X				AK3.03 - Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Idle loop flow	2.8	47
700000 Generator Voltage and Electric Grid Disturbances				X			AA1.05 - Ability to operate and/or monitor the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Engineered safety features.	3.9	48
295006 SCRAM / 1				X			AA1.01 - Ability to operate and/or monitor the following as they apply to SCRAM : RPS	4.2	49
295003 Partial or Complete Loss of AC / 6				X			AA1.04 - Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : D.C. electrical distribution system	3.6	50
295028 High Drywell Temperature / 5					X		EA2.05 - Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE : Torus/suppression chamber pressure: Plant-Specific	3.6	51
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	2.8	52
295038 High Off-site Release Rate / 9					X		EA2.03 - Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE : Radiation levels	3.5	53
295004 Partial or Total Loss of DC Pwr / 6						X	2.1.28 - Conduct of Operations: Knowledge of the purpose and function of major system components and controls.	4.1	54
295025 High Reactor Pressure / 3						X	2.1.32 - Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.8	55
295025 High Reactor Pressure / 3						X	2.2.42 - Equipment Control: Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	56
295023 Refueling Acc Cooling Mode / 8	X						AK1.02 - Knowledge of the operational implications of the following concepts as they apply to REFUELING ACCIDENTS : Shutdown margin	3.2	57
700000 Generator Voltage and Electric Grid Disturbances				X			AA1.03 - Ability to operate and/or monitor the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Voltage regulator controls.	3.8	58
K/A Category Totals:	5	2	3	4	3/4	3/3	Group Point Total:	20/7	

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Written Examination Outline  
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295010 High Drywell Pressure / 5					X		AA2.02 - Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE : Drywell pressure	3.9	83
295007 High Reactor Pressure / 3						X	2.2.40 - Equipment Control: Ability to apply technical specifications for a system.	4.7	84
295022 Loss of CRD Pumps / 1						X	2.1.32 - Conduct of Operations: Ability to explain and apply all system limits and precautions.	4.0	85
295035 Secondary Containment High Differential Pressure / 5	X						EK1.02 - Knowledge of the operational implications of the following concepts as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE : Radiation release	3.7	59
295033 High Secondary Containment Area Radiation Levels / 9		X					EK2.02 - Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS : Process radiation monitoring system	3.8	60
295015 Incomplete SCRAM / 1			X				AK3.01 - Knowledge of the reasons for the following responses as they apply to INCOMPLETE SCRAM : Bypassing rod insertion blocks	3.4	61
295013 High Suppression Pool Temperature / 5				X			AA1.01 - Ability to operate and/or monitor the following as they apply to HIGH SUPPRESSION POOL TEMPERATURE : Suppression pool cooling	3.9	62
295012 High Drywell Temperature / 5					X		AA2.01 - Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE : Drywell temperature	3.8	63
295008 High Reactor Water Level / 2						X	2.4.20 - Emergency Procedures / Plan: Knowledge of operational implications of EOP warnings, cautions, and notes.	3.8	64
295032 High Secondary Containment Area Temperature / 5	X						EK1.02 - Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Radiation releases	3.6	65
K/A Category Totals:	2	1	1	1	1/1	1/2	Group Point Total:	7/3	

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 Written Examination Outline  
 Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G	Imp	Q#
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259002 Reactor Water Level Control								X				A2.02 - Ability to (a) predict the impacts of the following on the REACTOR WATER LEVEL CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of any number of reactor feedwater flow inputs	3.4	86
264000 EDGs								X				A2.01 - Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS (DIESEL/JET) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Parallel operation of emergency generator	3.6	87
217000 RCIC											X	2.4.21 - Emergency Procedures / Plan: Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	4.6	88
215004 Source Range Monitor											X	2.2.37 - Equipment Control: Ability to determine operability and / or availability of safety related equipment.	4.6	89
206000 HPCI								X				A2.11 - 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: Low reactor water level: BWR-2,3,4	4.2	90
215005 APRM / LPRM	X											K1.01 - Knowledge of the physical connections and/or cause- effect relationships between AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM and the following: RPS	4.0	1
263000 DC Electrical Distribution	X											K1.03 - Knowledge of the physical connections and/or cause- effect relationships between D.C. ELECTRICAL DISTRIBUTION and the following: Battery ventilation	2.6	2
217000 RCIC		X										K2.02 - Knowledge of electrical power supplies to the following: RCIC initiation signals (logic)	2.8	3

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Written Examination Outline  
Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G	Imp	Q#
400000 Component Cooling Water		X										2.9	4
212000 RPS			X									3.6	5
205000 Shutdown Cooling			X									2.6	6
209001 LPCS				X								2.8	7
239002 SRVs				X								3.6	8
206000 HPCI					X							3.3	9
215003 IRM					X							2.6	10
300000 Instrument Air						X						2.5	11
223002 PCIS/Nuclear Steam Supply Shutoff						X						3.5	12

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 Written Examination Outline  
 Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G	Imp	Q#
264000 EDGs							X					3.0	13
262001 AC Electrical Distribution							X					2.7	14
218000 ADS								X				3.4	15
400000 Component Cooling Water								X				2.9	16
259002 Reactor Water Level Control									X			3.2	17
262002 UPS (AC/DC)									X			2.8	18
211000 SLC										X		4.1	19
215004 Source Range Monitor										X		3.4	20
206000 HPCI											X	4.5	21

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Written Examination Outline  
Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G	Imp	Q#	
261000 SGTS											X	2.4.8 - Emergency Procedures / Plan: Knowledge of how abnormal operating procedures are used in conjunction with EOP's.	3.8	22
262001 AC Electrical Distribution							X					K6.02 - Knowledge of the effect that a loss or malfunction of the following will have on the A.C. ELECTRICAL DISTRIBUTION: Off-site power	3.6	23
218000 ADS											X	2.1.23 - Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.3	24
215003 IRM										X		A4.07 - Ability to manually operate and/or monitor in the control room: Verification of proper functioning/ operability	3.6	25
212000 RPS				X								K4.11 - Knowledge of REACTOR PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: Operation with shorting links removed: Plant-Specific	3.3	26
K/A Category Totals:	2	2	2	3	2	3	2	2/3	2	3	3/2	Group Point Total:	26/5	



ILT Class 08-01 NRC  
 Written Examination Outline  
 Plant Systems – Tier 2 Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G	Imp.	Q #
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290002 Reactor Vessel Internals								X				A2.02 - Ability to (a) predict the impacts of the following on the REACTOR VESSEL INTERNALS ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Overpressurization transient	3.9	91
290002 Reactor Vessel Internals											X	2.2.42 - Equipment Control:: Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	4.6	92
268000 Radwaste											X	2.2.44 - Equipment Control: Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives effect plant and system conditions.	4.4	93
202002 Recirculation Flow Control	X											K1.01 - Knowledge of the physical connections and/or cause- effect relationships between RECIRCULATION FLOW CONTROL SYSTEM and the following: Recirculation system	3.5	27
230000 RHR/LPCI: Torus/Pool Spray Mode		X										K2.02 - Knowledge of electrical power supplies to the following: Pumps	2.8	28
201001 CRD Hydraulic			X									K3.03 - Knowledge of the effect that a loss or malfunction of the CONTROL ROD DRIVE HYDRAULIC SYSTEM will have on following: Control rod drive mechanisms	3.1	29
241000 Reactor/Turbine Pressure Regulator				X								K4.19 - Knowledge of REACTOR/TURBINE PRESSURE REGULATING SYSTEM design feature(s) and/or interlocks which provide for the following: Steam bypass valve control	3.6	30
216000 Nuclear Boiler Inst.					X							K5.12 - Knowledge of the operational implications of the following concepts as they apply to NUCLEAR BOILER INSTRUMENTATION : Effects on level indication due to rapid changes in void fraction	3.2	31
223001 Primary CTMT and Aux.						X						K6.14 - Knowledge of the effect that a loss or malfunction of the following will have on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES : RHR/LPCI	3.6	32

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Written Examination Outline  
Plant Systems – Tier 2 Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G	Imp.	Q #
214000 RPIS	X											3.0	33
268000 Radwaste								X				2.9	34
215002 RBM									X			3.1	35
290001 Secondary CTMT										X		3.2	36
290003 Control Room HVAC										X		4.6	37
219000 RHR/LPCI: Torus/Pool Cooling Mode				X								3.3	38
K/A Category Totals:	2	1	1	2	1	1	0	1/1	1	1	1/2	Group Point Total: 12/3	

Facility:		ILT Class 08-01 NRC		Date:			
Category	K/A #	Topic	RO		SRO-Only		
			IR	Q#	IR	Q#	
1. Conduct of Operations	2.1.20	Ability to interpret and execute procedure steps.			4.6	94	
	2.1.41	Knowledge of the refueling process.			3.7	98	
	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	4.1	66			
	2.1.36	Knowledge of procedures and limitations involved in core alterations.	3.0	67			
	Subtotal			2	2		
2. Equipment Control	2.2.37	Ability to determine operability and / or availability of safety related equipment.			4.6	95	
	2.2.23	Ability to track Technical Specification limiting conditions for operations.			4.6	99	
	2.2.6	Knowledge of the process for making changes to procedures.	3.0	68			
	2.2.17	Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritizaion, coordination with the transmission system operator.	2.6	69			
	2.2.41	Ability to obtain and interpret station electrical and mechanical drawings.	3.5	74			
	Subtotal			3	2		
3. Radiation Control	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.			3.1	96	
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.			3.7	100	
	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5	70			
	2.3.12	Knowledge of Radiological Safety Principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.2	71			

	Subtotal			2		2
4. Emergency Procedures / Plan	2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.			4.4	97
	2.4.22	Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.	3.6	72		
	2.4.46	Ability to verify that the alarms are consistent with the plant conditions.	4.2	73		
	2.4.35	Knowledge of local auxiliary operator tasks during emergency and the resultant operational effects.	3.8	75		
	Subtotal				3	1
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1 / 1	295027 / EK1.01	Cooper Station has Mark 1 containment.
2 / 1	209002 / K2.02	Cooper Nuclear Station is a BWR 4 and does not have High Pressure Core Spray, this K/A is specific to BWR 5, 6.
2 / 1	207000 / K2.02	Cooper Nuclear Station is a BWR 4 and does not have Isolation Condensers, this K/A specific to BWR 2, 3.
2 / 1	207000 / K6.01	Cooper Nuclear Station is a BWR 4 and does not have Isolation Condensers, this K/A specific to BWR 2, 3.
2 / 1	207000 / K4.04	Cooper Nuclear Station is a BWR 4 and does not have Isolation Condensers, this K/A specific to BWR 2, 3.
2 / 2	286000 / K6.05	Cooper Nuclear Station has specific fire pumps that draw water from a storage tank. This water is supplied via a well system and does not come to the fire tanks via the screen wash system. These 2 systems do not intertie so this K/A is not applicable.
2 / 2	223001 / K6.10	Cooper Nuclear Station uses a Mark 1 containment, this K/A is for Mark 3 containments and does not apply.
2 / 2	223001 / A1.03	Cooper Nuclear Station uses a Mark 1 containment, this K/A is specific to Mark 3 containments and does not apply.
1 / 1	295019 / AK2.13	The subject K/A isn't relevant at the subject facility.
1 / 1	600000 / AA1.08	It isn't possible to prepare a psychometrically sound question related to the subject K/A.
2 / 1	203000 / K5.01	It isn't possible to prepare a psychometrically sound question related to the subject K/A.
2 / 2	202001 / K3.06	The subject K/A isn't relevant at the subject facility.
2 / 2	201004 / A3.03	The subject K/A isn't relevant at the subject facility.
1 / 1	295005 / AK1.03	Duplicate K/A from question 39.
1 / 1	295030 / 2.4.49	This K/A requires a from memory immediate operator action. The actions for Low SP level are basedon EOPs and are not from memory. The EOPs are references for other exam questions on the Exam and the student will have these.
1 / 1	295027 / EA2.04	Cooper Nuclear Station uses a Mark 1 containment, this K/A is specific to a Mark 3 containment and does not apply.
2 / 2	202002 / A2.08	Cooper Nuclear Station is a BWR 4 and does not have Flow Control Valves in the Recirculation Flow control system, this K/A is specific to BWR 5, 6 and does not apply.
1 / 1	295038 / 2.4.49	K/A has no compatibility with 10CFR55.43 (b)

2 / 1	209002 / 2.2.12	The subject K/A isn't relevant at the subject facility.
2 / 1	262002 / A2.04	The subject K/A isn't relevant at the subject facility.
2 / 2	215002 / 2.2.38	The subject K/A isn't relevant at the subject facility.
2 / 1	264000 / 2.4.18	Can not develop question that meets the requirements of 10CFR55.43(b) and this K/A.
2 / 1	300000 / 2.4.1	Can not develop question that meets the requirements of 10CFR55.43(b) and this K/A.
2 / 2	239003 / A2.10	The subject K/A isn't relevant at the subject facility.
1 / 1	600000 / AA2.05	Can not develop a question that meets requirements of 10CFR55.43(b) and this K/A..
1 / 1	295023 / AA2.04	Can not develop a question that meets the requirements of 10CFR55.43(b) and this K/A
1 / 2	295008 / AA2.04	Can not develop a question that meets the requirements of 10CFR55.43(b) and this K/A.
1 / 1	295021 / 2.2.25	This is a tech spec basis question which is SRO only and not appropriate for the RO portion of the exam.