

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	3	3	3	N/A			3	3	N/A			3	18	3	3	6	
	2	2	1	1	N/A			1	2	N/A			2	9	2	2	4	
	Tier Totals	5	4	4	N/A			4	5	N/A			5	27	5	5	10	
2. Plant Systems	1	3	3	3	3	2	2	2	2	2	3	3	28	3	2	5		
	2	1	0	1	1	1	1	1	1	1	1	10	0	2	1	3		
	Tier Totals	4	3	4	4	3	3	3	3	3	4	4	38	5	3	8		
3. Generic Knowledge and Abilities Categories				1		2		3		4		10		1	2	3	4	7
				3		3		2		2				2	1	2	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	PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)						Form ES-401-2		
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 Reactor Trip – Stabilization – Recovery / 1									
000008 Pressurizer Vapor Space Accident / 3		0 3					Controllers and positioners	2.5	1
000009 Small Break LOCA / 3									
000011 Large Break LOCA / 3			0 1		S		R: Verifying Main Steam Isolation Valve position S: A2.01 Actions to be taken, based on RCS temperature and pressure saturated and superheated	3.4 4.7	2 76
000022 Loss of Rx Coolant Makeup / 2				0 3			PZR level trend	3.2	3
000026 Loss of Component Cooling Water / 8					0 6	S	R: The length of time after the loss of CCW flow to a component before that component may be damaged S: 2.2.38: Knowledge of conditions and limitations in the facility license	2.8 4.5	4 77
000029 ATWS / 1						R	2.1.20: Ability to interpret and execute procedure steps	4.6	5
000038 Steam Gen. Tube Rupture / 3	0 1						Use of steam tables	3.1	6
000040 (W/E12) Steam Line Rupture – Uncontrolled Depressurization of all Steam Generators / 4	0 1				S		Components, capacity, and function of emergency systems S: A2.04: Conditions requiring ESFAS initiation	3.4 4.7	7 78
000054 (CE/E06) Loss of Main Feedwater / 4						R	2.2.36: Ability to analyze the effect of maintenance activities, such as degraded power sources on the status of limiting conditions for operations.	3.1	8
000055 Station Blackout / 6						R	2.2.4: Ability to explain the variations in control board layouts, systems, instrumentation, and procedural actions between units at a facility.	3.6	9
000056 Loss of Off-site Power / 6			0 1			S	Order and time to initiation of power for the load sequencer S: 2.4.21: 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.	3.5 4.6	10 79
000057 Loss of Vital AC Inst. Bus / 6			0 1				Actions contained in EOP for loss of vital AC electrical instrument bus	4.1	11
000058 Loss of DC Power / 6				0 1			Cross-tie of the affected dc bus with the alternate supply	3.4	12

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E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000062 Loss of Nuclear Svc Water / 4				0 7			Flow rates to the components and systems that are serviced by the SWS: interactions among the components	3.8	13
000065 Loss of Instrument Air / 8					0 7		Whether backup nitrogen supply is controlling valve position	2.8	14
000065 Loss of Instrument Air / 8					S		S: A2.04: Typical conditions which could cause a compressor trip (e.g. high temperature)	2.7	80
W/E04 LOCA Outside Containment / 3					0 2		Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	3.6	15
W/E11 Loss of Emergency Coolant Recirc. / 4		0 1					Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.6	16
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4		0 2					Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	3.9	17
000077 Generator Voltage and Electric Grid Disturbances / 6	0 2					S	R: Over-excitation S: 2.4.47: Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material	3.3 4.2	18 81
K/A Category Totals:	3	3	3	3	3 / 3	3 / 3	Group Point Total:		18/ 6

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1		0 1					Rod bank step counters	2.9	19
000005 Inoperable/Stuck Control Rod / 1			0 6				Actions contained in EOP for inoperable/stuck control rod	3.9	20
000024 Emergency Boration / 1					S		S: A2.06	3.7	82
000028 Pressurizer Level Malfunction / 2				0 6			Checking of RCS leaks	3.3	21
000033 Loss of Intermediate Range NI / 7					1 2		Maximum allowable channel disagreement	2.5	22
000036 Fuel Handling Accident / 8						S	S: 2.1.23: Ability to perform specific system and integrated plant procedures during all modes of plant operation	4.4	83
000037 Steam Generator Tube Leak / 3						R	2.4.1: Knowledge of EOP entry conditions and immediate action steps	4.6	23
000059 Accidental Liquid RadWaste Rel. / 9	0 1						Types of radiation, their units of intensity and the location of the sources of radiation in a nuclear power plant	2.7	24
W/E13 Steam Generator Over-pressure / 4					0 2		Adherence to appropriate procedures and operation within the limitations in the facility license and amendments	3.0	25
W?E15 Containment Flooding / 5					0 1		S: A2.01: Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.2	84
W/E16 High Containment Radiation / 9						R	2.1.30: Ability to locate and operate components, including local controls	4.4	26
BW/A02&A03 Loss of NNI-X/Y / 7	0 3						Annunciators and conditions indicating signals, and remedial actions associated with the Natural Circulation Operations	3.3	27
W/E08 RCS Overcooling – PTS / 4						S	S; 2.2.25: Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits	4.2	85
K/A Category Point Totals:	2	1	1	1	2 / 2	2 / 2	Group Point Total:		9/4

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	#	
003 Reactor Coolant Pump						1						S	Starting requirements	2.6	28
						4							S: 2.4.45: Ability to prioritize and interpret the significance of each annunciator or alarm	4.3	86
004 Chemical and Volume Control						3							Boron loading of demineralizer resin	2.9	29
005 Residual Heat Removal							0						Detection of and response to presence of water in RHR emergency sump	3.3	30
006 Emergency Core Cooling							0						Boron concentration in accumulator, boron storage tanks	3.0	31
007 Pressurizer Relief/Quench Tank								0					Exceeding PRT high-pressure limits	3.2	32
007 Pressurizer Relief/Quench Tank								S					A2.01: Stuck-open PORV or code safety	4.2	87
008 Component Cooling Water							0						Loss of CCW pump	3.3	33
010 Pressurizer Pressure Control									0				PZR pressure	3.6	34
012 Reactor Protection									0				Trip logic	3.7	35
									6	0			Channel defeat controls	3.6	36
013 Engineered Safety Features Actuation										0		S	Reset of ESFAS channels	4.3	37
										2			S: 2.4.35: Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects	4.0	88
022 Containment Cooling										0		x	Valves in the CCS	3.1	38
										4			2.2.22: Knowledge of limiting conditions for operations and safety limits	4.0	39
026 Containment Spray												x	2.2.39: Knowledge of less than or equal to one hour Tech Specs action statements for systems	3.9	40
039 Main and Reheat Steam	0											x	T/G	2.5	41
	5												Ability to verify that the alarms are consistent with the plant conditions	4.2	42
059 Main Feedwater	0											S	S/Gs	3.1	43
	3												S: A2.05: Rupture in MFW suction or discharge line	3.4	89

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / SRO)											Form ES-401-2	
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	#
061 Auxiliary/Emergency Feedwater		0			0							AFW electric driven pumps	3.7	44
		2			5							Feed line voiding and water hammer	2.7	45
062 AC Electrical Distribution		0										Major system loads	3.3	46
063 DC Electrical Distribution		0	0									Major DC loads	2.9	47
		1	1									EDG	3.7	48
064 Emergency Diesel Generator			0									ESFAS controlled or actuated systems	4.2	49
073 Process Radiation Monitoring				0	0			S				Release termination when radiation exceeds setpoint	4.0	50
				1	1							Radiation theory, including sources, types, units, and effects	2.5	51
												S: A2.03: Calibration drift	2.9	90
076 Service Water				0								ESFAS controlled or actuated systems	4.2	52
078 Instrument Air	0			0								MSIV air	3.4	53
	5			1								Manual/automatic transfers of control	2.7	54
103 Containment			0									Loss of containment integrity under shutdown conditions	3.3	55
K/A Category Point Totals:	3	3	3	3	2	2	2	2	3	2	3	Group Point Total:		28
								2			3			/
								3			2			5

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO)										Form ES-401-2		
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	#
001 Control Rod Drive						0 5						Reactor trip breakers, including controls	3.7	56
002 Reactor Coolant														
011 Pressurizer Level Control											S	S: 2.1.32: Ability to explain and apply system limits and precautions	4.0	91
014 Rod Position Indication							0 3					VCT level	2.8	57
016 Non-nuclear Instrumentation												Subcritical multiplication and NIS indications	3.4	58
017 In-core Temperature Monitor								S				S: A2.02: Core damage	4.1	92
029 Containment Purge									0 1			CPS isolation	3.8	59
033 Spent Fuel Pool Cooling														
034 Fuel Handling Equipment								S			R	R: 2.1.28: Knowledge of the purpose and function of major system components and controls	4.1	60
												S: A2.02: Dropped cask	3.9	93
035 Steam Generator														
041 Steam Dump/Turbine Bypass Control	0 5											RCS	3.5	61
045 Main Turbine Generator														
055 Condenser Air Removal			0 1									Main condenser	2.5	62
056 Condensate														
068 Liquid Radwaste										0 4		Automatic isolation	3.8	63
071 Waste Gas Disposal														
072 Area Radiation Monitoring				0 3								Plant ventilation systems	3.2	64
075 Circulating Water														
079 Station Air								0 1				Cross-connection with IAS	2.9	65
086 Fire Protection														
K/A Category Point Totals:	1	0	1	1	1	1	1	1 / 2	1	1	1 / 1	Group Point Total:		10 / 3

Facility: <u>Point Beach U1/U2</u>			Date of Exam: <u>02/23/2015</u>			
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc	2.9	66		
	2.1.36	Knowledge of procedures and limitations involved in core alterations	3.0	67		
	2.1.45	Ability to identify and interpret diverse indications to validate the response of another indicator.	4.3	68		
	2.1.2	Knowledge of operator responsibilities during all modes of plant operation			4.4	94
	2.1.35	Knowledge of the fuel-handling responsibilities of SROs			3.9	95
	Subtotal				3	2
2. 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	4.5	69		
	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels	4.6	70		
	2.2.35	Ability to determine Technical Specification Mode of Ops	3.6	71		
	2.2.19	Knowledge of maintenance work order requirements			3.4	96
	Subtotal				3	1
3. Radiation Control	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions	3.5	72		
	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	73		
	2.3.13	Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc.			3.8	97
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.			3.8	98
	Subtotal				2	2
4. Emergency Procedures / Plan	2.4.20	Knowledge of the operational implications of EOP warnings, cautions, and notes	3.8	74		
	2.4.39	Knowledge of RO responsibilities in emergency plan implementation	3.9	75		
	2.4.38	Ability to take actions called for in the facility emergency plan, including acting as emergency coordinator if required.			4.4	99
	2.4.40	Knowledge of SRO responsibilities in emergency plan implementation			4.5	100
	Subtotal				2	2
Tier 3 Point Total				10		7