

As administered.

Facility: Point Beach Nuclear Plant		Date of Exam: 16 Oct 2000		Exam Level: RO									
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	2	4				2	4			1	16
	2	3	1	4				5	2			2	17
	3	1	1	0				0	0			1	3
	Tier Totals	7	4	8				7	6			4	36
2. Plant Systems	1	2	1	1	3	3	1	2	3	2	3	2	23
	2	4	1	2	3	2	1	2	1	1	2	1	20
	3	1	1	0	2	1	0	0	0	2	0	1	8
	Tier Totals	7	3	3	8	6	2	4	4	5	5	4	51
3. Generic Knowledge and Abilities							Cat 1	Cat 2	Cat 3	Cat 4	13		
							3	2	4	4			
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>6. Actual point totals must match those specified in the table.</p> <p>7. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>8. Systems/evolutions within each group are identified on the associated outline.</p> <p>9. The shaded areas are not applicable to the category/tier.</p> <p>6.* The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>													

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 1							Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1	X						005AK1.02 Knowledge of operational implications of flux tilt as applied to a Inoperable/Stuck Control Rod.	3.1	1
000015/17 RCP Malfunctions / 04						X	2.2.22 Knowledge of LCOs and safety limits.	3.4	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4					X		W/E09EA2.2 Ability to determine/interpret adherence to appropriate procedures and operation within the limitations in the facility license and amendments.	3.4	1
000024 Emergency Boration / 1					X		024AA2.05 Determine/interpret amount of boron to add to achieve required SDM.	3.3	1
000026 Loss of Component Cooling Water / 8			X				026AK3.04 Reason for responses as applied to the effect on the CCW flow header of a loss of CCW.	3.5	1
000027 Pressurizer Pressure Control System Malfunction / 3	X						027AK1.01 Operational implications of the definition of saturation temperature.	3.1	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture – Excessive Heat Transfer / 4			X				W/E12EK3.1 Reasons for responses as applied to uncontrolled steam generator depressurization associated with facility operating characteristics during transient conditions.	3.5	1
CE/A11; W/E08 RCS Overcooling – PTS / 4				X			W/E08EA1.3 Operate/monitor desired operating results during abnormal and emergency situations.	3.6	1
000051 Loss of Condenser Vacuum / 4					X		051AA2.02 Determine/interpret conditions requiring reactor and/or turbine trip.	3.9	1
000055 Station Blackout / 6			X				055EK3.02 Knowledge of reasons for actions contained in EOP for loss of offsite and onsite power.	4.3	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					X		057AA2.19 Ability to determine/interpret plant automatic actions that will occur on a loss of vital ac electrical instrument bus	4.0	1
000062 Loss of Nuclear Service Water / 4							NOT SELECTED		
000067 Plant Fire On-site / 9				X			067AA1.06 Operate/monitor fire alarm as applied to Plant Fire.	3.5	1
000068 (BW/A06) Control Room Evacuation / 8			X				068AK3.12 Knowledge of sequence of actions for emergency evacuation of control room.	4.1	1
000069 (W/E14) Loss of CTMT Integrity / 5	X						069AK1.01 Operational implications of the effects of pressure on leak rate as applied to loss of containment integrity.	2.6	1
000074 (W/E06&E07) Inadequate Core Cooling / 4		X					074EK2.04 Knowledge of the interrelationships between the HPI pumps and inadequate core cooling.	3.9	1
BW/E03 Inadequate Subcooling Margin / 4							N/A	N/A	N/A
000076 High Reactor Coolant Activity / 9		X					076AK2.01 Knowledge of the interrelations between high RCS Activity and process radiation monitors.	2.6	1
BW/A02&A03 Loss of NNI-X/Y / 7							N/A	N/A	N/A
K/A Category Totals:	3	2	4	2	4	1	Group Point Total:		16

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2							Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1	X						<u>001AK1.05</u> Operational implications of turbine-reactor power mismatch on rod control.	3.5	1
000003 Dropped Control Rod / 1				X			<u>003AA1.03</u> Operate/monitor rod control switches as applied to dropped control rod.	3.6	1
000007 (BW/E02&E10; CE/E02) Reactor Trip – Stabilization – Recovery / 1						X	<u>2.4.31</u> Knowledge of annunciators, alarms and indications, and use of response instructions.	3.3	1
BW/A01 Plant Runback / 1							N/A	N/A	N/A
BW/A04 Turbine Trip / 4							N/A	N/A	N/A
000008 Pressurizer Vapor Space Accident / 3		X					<u>008AK2.02</u> Interrelations with sensors/detectors.	2.7	1
000009 Small Break LOCA / 3	X						<u>009EK1.01</u> Operational implications of natural circulation and cooling, including reflux.	4.2	1
000011 Large Break LOCA / 3							NOT SELECTED		
W/E04 LOCA Outside Containment / 3	X						<u>W/E04EK1.1</u> Operational implications of components, capacity, function of emergency systems.	3.5	1
BW/E08; W/E03 LOCA Cooldown/Depress. / 4							NOT SELECTED		
W/E11 Loss of Emergency Coolant Recirc. / 4							NOT SELECTED		
W/E01 & E02 Rediagnosis & SI Termination / 3				X			<u>W/E02EA1.3</u> Operate/monitor desired operating results during abnormal and emergency situations.	3.8	1
000022 Loss of Reactor Coolant Makeup / 2				X			<u>022AA1.01</u> Operate/monitor CVCS Letdown and Charging as applied to loss of Reactor Coolant Makeup.	3.4	1
000025 Loss of RHR System / 4							NOT SELECTED		
000029 Anticipated Transient w/o Scram / 1						X	<u>2.4.12</u> Knowledge of crew responsibilities during emergency operations.	3.4	1
000032 Loss of Source Range NI / 7				X			<u>032AA1.01</u> Ability to operate/monitor manual power restoration as applied to loss of SR nuclear instrumentation.	3.1	1
000033 Loss of Intermediate Range NI / 7				X			<u>033AA1.02</u> Ability to operate/monitor level trip bypass as applied to loss of IR nuclear instrumentation.	3.0	1
000037 Steam Generator Tube Leak / 3					X		<u>037AA2.10</u> Ability to determine and interpret tech spec limits for RCS leakage as applied to a SGTL.	3.2	1
000038 Steam Generator Tube Rupture / 3					X		<u>038EA2.03</u> Ability to determine or interpret which S/G is ruptured.	4.4	1
000054 (CE/E06) Loss of Main Feedwater / 4			X				<u>054AK3.05</u> Reasons for HPI/PORV cycling upon total feedwater loss as applied to loss of MFW.	4.6	1
BW/E04; W/E05 Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4							NOT SELECTED		
000058 Loss of DC Power / 6							NOT SELECTED		
000059 Accidental Liquid RadWaste Rel. / 9			X				<u>059AK3.01</u> Reason for termination of radioactive liquid release.	3.5	1

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (CONTINUED)							Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000060 Accidental Gaseous Radwaste Rel. / 9			X				060AK3.02 Reason for isolation of auxiliary building ventilation.	3.3	1
000061 ARM System Alarms / 7			X				061AK3.02 Reasons for guidance contained in alarm response.	3.4	1
W/E16 High Containment Radiation / 9							NOT SELECTED		0
CE/E09 Functional Recovery							N/A	N/A	N/A
K/A Category Totals:	3	1	4	5	2	2	Group Point Total:		17

ES-401	PWR RO Examination Outline Plant Systems – Tier 2/Group 1											For ES-401-4		
E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive						X		X				<p>001A2.01 Predict impact of loss of CCW or fan cooling and use procedures to correct, control, or mitigate consequences.</p> <p>001K6.02 Knowledge of the effect of a loss or malfunction of sensors feeding into the CRDS.</p>	3.1 2.8	2
003 Reactor Coolant Pump							X				X	<p>003A1.06 Predict/monitor changes in PZR spray flow associated with operating RCP controls.</p> <p>003A4.04 Manually operate and/or monitor RCP seal differential pressure instrumentation in the control room.</p>	2.9 3.1	2
004 Chemical and Volume Control				X		X						<p>004K4.03 Knowledge of CVCS design features(s) and/or interlock(s) which provide protection of ion exchangers.</p> <p>004K5.19 Operational implications of SDM as it applies to CVCS.</p>	2.8 3.5	2
013 Engineering Safety Features Actuation	X											<p>013K1.11 Physical connections/cause effect relationship between ESFAS and CVCS.</p> <p>013K2.01 Bus power supplies to ESFAS/Safeguards equipment control.</p>	3.3 3.6	2
015 Nuclear Instrumentation		X				X					X	<p>2.1.22 Ability to determine mode of operation.</p> <p>015K5.05 Knowledge of the operational implications of criticality and its indications as applied to NIS.</p>	2.8 4.1	2
017 In-core Temperature Monitor			X						X			<p>017K3.01 Effect of loss/malfunction of ITM system on natural circulation indications.</p> <p>017A3.01 Ability to monitor auto operation of the ITM system including indications of normal, natural, and interrupted circulation of the RCS.</p>	3.5 3.6	2
022 Containment Cooling											X	<p>022A4.02 Ability to manually operate and/or monitor CSS pumps in the control room.</p>	3.2	1

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PWR RO Examination Outline
Plant Systems – Tier 2/Group 1
(CONTINUED)

Form ES-401-4

E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
025 Ice Condenser														
056 Condensate	X							X				<u>056K1.03</u> Physical connections/cause effect between condensate and MFW. <u>056A2.04</u> Predict impact of loss of condensate pumps on condensate system.	2.6 2.6	2
059 Main Feedwater				X				X				<u>059K4.13</u> MFW design features/interlocks for feedwater fill of S/G upon loss of RCPs. <u>059A2.07</u> Predict impact of tripping MFW pump turbine on MFW and use procedures to correct, control, or mitigate consequences.	2.9 3.0	2
061 Auxiliary/Emergency Feedwater							X					<u>061A1.04</u> Predict/monitor changes in AFW source tank level associated with operating the AFW controls.	3.9	1
068 Liquid Radwaste									X			<u>068A3.02</u> Ability to monitor automatic operation of the liquid radwaste system including automatic isolation.	3.6	1
071 Waste Gas Disposal				X		X						<u>071K5.04</u> Knowledge of the operational implication of the hydrogen/oxygen concentrations to flammability. <u>071K4.04</u> Knowledge of design feature(s)/interlock(s) which provide isolation of waste gas release tanks.	2.5 2.9	2
072 Area Radiation Monitoring										X	X	<u>2.2.28</u> Knowledge of new and spent fuel movement procedures. <u>072A4.01</u> Manually operate/monitor alarm and interlock setpoint checks and adjustments in the control room.	2.6 3.0	2
K/A Category Totals:	2	1	1	3	3	1	2	3	2	3	2	Group Point Total:		23

ES-401	PWR RO Examination Outline Plant Systems – Tier 2/Group 2											For ES-401-4		
E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant									X			002A3.03 Monitor automatic operation of RCS pressure, temperature, and flows.	4.4	1
006 Emergency Core Cooling							X					006A1.02 Predict/monitor changes in boron concentration in accumulator, boron storage tanks associated with operating ECCS controls.	3.0	1
010 Pressurizer Pressure Control				X								010K4.01 Design features/interlocks for spray valve warm-up.	2.7	1
011 Pressurizer Level Control										X		011A4.03 Manually operate/monitor PZR heaters in the control room.	3.3	1
012 Reactor Protection										X		012A4.03 Manually operate/monitor channel blocks and bypasses in the control room.	3.6	1
014 Rod Position Indication					X							014K5.02 Operational implications of RPIS independent of demand position as it applies to RPIS.	2.8	1
016 Non-Nuclear Instrumentation											X	2.2.2 Ability to manipulate console controls to operate facility between shutdown and designated power levels.	4.0	1
026 Containment Spray				X								026K4.04 Knowledge of CSS design feature(s) and/or interlock(s) which provide for reduction of temperature and pressure in containment after a LOCA.	3.7	1
029 Containment Purge								X				029A2.03 Predict impact of startup operations and associated valve lineups and use procedures to correct, control, or mitigate consequences.	2.7	1
033 Spent Fuel Pool Cooling	X											033K1.02 Physical connections/cause-effect relationship between Spent Fuel Pool Cooling system and the RHRS.	2.5	1
035 Steam Generator			X									035K5.01 Knowledge of operational implications as applied to secondary parameters, pressure, temp. and reactivity.	3.4	1
039 Main and Reheat Steam	X											039K1.01 Physical connections/cause-effect relationship between MRSS and S/G.	3.1	1
055 Condenser Air Removal			X									055K3.01 Effect of loss/malfunction of the CARS on main condenser.	2.5	1

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions – Tier 2/Group 2 (CONTINUED)											Form ES-401-4		
E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
062 AC Electrical Distribution				X								062K4.07 Design features/interlocks which provide for one-line diagram of 4 kV to 480v distribution, including sources of normal and alternative power.	2.7	1
063 DC Electrical Distribution							X					063A1.01 Predict/monitor changes in parameters associated with battery capacity as it is effected by discharge rate.	2.5	1
064 Emergency Diesel Generator		X										064K2.03 Bus power supplies to control power.	3.2	1
073 Process Radiation Monitoring			X									073K3.01 Effect of loss/malfunction of PRM on radioactive effluent releases.	3.6	1
075 Circulating Water	X											075K1.02 Physical connections/cause-effect relationship between circulating water system and liquid radwaste discharge.	2.9	1
079 Station Air	X											079K1.01 Physical connections/cause-effect relationships between the SAS and IAS.	3.0	1
086 Fire Protection						X						086K6.04 Effects of loss/malfunction of fire, smoke, and heat detectors on the Fire Protection System.	2.6	1
K/A Category Totals:	4	1	2	3	2	1	2	1	1	2	1	Group Point Total:		20

ES-401	PWR RO Examination Outline Plant Systems – Tier 2/Group 3											For ES-401-4		
E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal				X								<u>005K4.03</u> Knowledge of RHRS design features and/or interlocks which provide RHR heat exchanger bypass flow control.	2.9	1
007 Pressurizer Relief/Quench Tank	X											<u>007K1.01</u> Physical connections and/or cause-effect relationship between PRTS and the containment system.	2.9	1
008 Component Cooling Water												NOT SELECTED		
027 Containment Iodine Removal												N/A	N/A	N/A
028 Hydrogen Recombiner and Purge Control		X										<u>028K2.01</u> Bus power supply to the hydrogen recombiners.	2.5	1
034 Fuel Handling Equipment					X							<u>034K5.02</u> Operational implications of limiting load as applied to the Handling System.	2.0	1
041 Steam Dump/Turbine Bypass Control				X								<u>041K4.18</u> Knowledge of the SDS design feature(s) and/or interlocks(s) which provide for a turbine trip.	3.4	1
045 Main Turbine Generator									X			<u>045A3.08</u> Monitor automatic operation of the MT/G system, including determination from throttle/governor indicators of turbine trip: several indications, including CRDS trip alarm.	3.3	1
076 Service Water											X	<u>2.4.48</u> Ability to interpret control room indications to verify status and operation	3.5	1
078 Instrument Air												NOT SELECTED		
103 Containment									X			<u>103A3.01</u> Monitor automatic operation of containment isolation.	3.9	1
K/A Category Totals:	1	1	0	2	1	0	0	0	2	0	1	Group Point Total		8
Plant-Specific Priorities														
System / Topic						Recommended Replacement for...						Reason		Points
Plant-Specific Priority Total: (limit 10)														

1

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Facility: PBNP		Date of Exam: 16 October 2000		Exam Level: RO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	<u>2.1.19</u>	Ability to use plant computer to obtain/evaluate parametric information on system/component status	3.0	1	
	<u>2.1.20</u>	Ability to execute procedure steps	4.3	1	
	<u>2.1.21</u>	Ability to obtain and verify controlled procedure	3.1	1	
	Total			3	
Equipment Control	<u>2.2.11</u>	Knowledge of process for controlling temporary changes	2.5	1	
	<u>2.2.24</u>	Ability to analyze affect of maintenance on LCO status	2.6	1	
	Total			2	
Radiation Control	<u>2.3.1</u>	Knowledge of 10CFR20 and related facility radiation control requirements	2.6	1	
	<u>2.3.2</u>	Knowledge of facility ALARA program	2.5	1	
	<u>2.3.4</u>	Knowledge of radiation exposure limits/contamination control including levels in excess of those authorized	2.5	1	
	<u>2.3.10</u>	Ability to perform procedure to reduce excessive levels of radiation and guard against personnel exposure	2.9	1	
	Total			4	
Emergency Procedures/ Plan	<u>2.4.6</u>	Knowledge of symptom based EOP mitigation strategies	3.1	1	
	<u>2.4.12</u>	Knowledge of general operating crew responsibilities during emergency operations	3.4	1	
	<u>2.4.17</u>	Knowledge of EOP terms and definitions	3.1	1	
	<u>2.4.48</u>	Ability to interpret Control Room indications to verify the status and operation of system, and understand how operator actions and directives affect plant system conditions.	3.5	1	
	Total			4	
Tier 3 Point Total (RO)				13	

Facility: PBNP		Date of Exam: 16 October 2000		Exam Level: SRO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	<u>2.1.6</u>	Ability to supervise and assume a management role during plant transients and upset conditions.	4.3	1	
	<u>2.1.9</u>	Ability to direct personnel activities inside the CR	4.0	1	
	<u>2.1.20</u>	Ability to execute procedure steps (RO)	4.2	1	
	<u>2.1.23</u>	Ability to perform specific system and integrated plant procedures during all modes of operation	4.0	1	
	Total				4
Equipment Control	<u>2.2.2</u>	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	3.5	1	
	<u>2.2.24</u>	Ability/analyze affect of maintenance on LCO s	3.8	1	
	<u>2.2.29</u>	Knowledge of SRO fuel handling responsibilities	3.8	1	
	Total				3
Radiation Control	<u>2.3.1</u>	Knowledge of 10 CFR 20 and related facility radiation control requirements. (RO)	3.0	1	
	<u>2.3.4</u>	Knowledge of radiation exposure limits/contamin. control including levels in excess of those authorized (RO)	3.1	1	
	<u>2.3.5</u>	Knowledge of use/function of personnel monitor. equip.	2.5	1	
	<u>2.3.8</u>	Knowledge of the process for performing a planned radioactive gaseous release	3.2	1	
	<u>2.3.10</u>	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. (RO)	3.3	1	
	Total				5
Emergency Procedures/ Plan	<u>2.4.6</u>	Knowledge of symptom based EOP mitigation strategies	4.0	1	
	<u>2.4.12</u>	Knowledge of general operating crew responsibilities during emergency operations	3.9	1	
	<u>2.4.20</u>	Knowledge of operational implications of EOP warnings, cautions, and notes	4.0	1	
	<u>2.4.31</u>	Knowledge of annunciators alarms and indications and use of response instructions	3.4	1	
	<u>2.4.48</u>	Ability to interpret Control Room indications to verify the status and operation of system, and understand how operator actions and directives affect plant system conditions. (RO)	3.8	1	
	Total				5
Tier 3 Point Total (SRO)					17