

## **FINAL OUTLINES**

**FOR THE POINT BEACH INITIAL EXAMINATION - SEPT 2003**

Facility: <b>Point Beach Nuclear Plant</b> Examination Level: <b>RO</b>		Date of Examination: <b>9/29-10/3/03</b> Operating Test Number: <b>2003301</b>
Administrative Topic (see Note)	Describe activity to be performed:	
Conduct of Operations / <b>Shift Turnover</b>	Conduct a Control Board Walk-down for Shift Turnover (identify ALL abnormal items using Turnover Checklist, similar to last NRC exam, with varied items).	
Conduct of Operations / <b>Plant Parameter Verification</b>	Perform a Pressurizer Heater Input Test Calculation (new JPM).	
Equipment Control / <b>Tagging &amp; Clearances</b>	Review a Tag Series for adequacy (similar to 2000 NRC Exam).	
Radiation Control / <b>Radiation Exposure Limits</b>	Perform a stay-time calculation (new JPM).	
Emergency Plan	N/A	
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.		

Facility: **Point Beach Nuclear Plant**  
Examination Level: **SRO**

Date of Examination: **9/29-10/3/03**  
Operating Test Number: **2003301**

Administrative Topic (see Note)	Describe activity to be performed:
Conduct of Operations / <b>Shift Turnover</b>	Conduct a Control Board Walk-down for Shift Turnover (identify ALL abnormal items using Turnover Checklist, similar to last NRC exam, with varied items).
Conduct of Operations / <b>Plant Parameter Verification</b>	Perform a Pressurizer Heater Input Test Calculation (new JPM).
Equipment Control / <b>Tagging &amp; Clearances</b>	Review a Tag Series for adequacy (similar to 2000 NRC Exam).
Radiation Control / <b>Knowledge of Radiation Exposure Limits</b>	Evaluate an Emergency Dose Extension (new JPM).
Emergency Plan / <b>Emergency Action Levels and Classifications</b>	Make an Emergency Plan Classification (includes PARS, new JPM).
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.	

Facility: **Point Beach Nuclear Plant**  
Exam Level : **RO**

Date of Examination: **9/29-10/3/03**  
Operating Test No: **2003301**

Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

System / JPM Title	Type Code*	Safety Function
a. <b>Control Rod Drive System</b> / Respond To Uncontrolled Rod Motion.	D, S, A	1
b. <b>Chemical &amp; Volume Control System</b> / Manually Makeup To The VCT.	M, S, A	2
c. <b>Emergency Core Cooling System</b> / Fill An Accumulator Gas Space.	D, S	3
d. <b>Reactor Coolant Pump System</b> / Start A Reactor Coolant Pump (last NRC exam)	D, S, L	4 (primary)
e. <b>Auxiliary Feedwater System</b> / Raise Steam Generator Level Using Auxiliary Feedwater	N, S, L, A	4 (secondary)
f. <b>Containment Spray System</b> / Secure Containment Spray	D, S, L (ESF)	5
g. <b>Emergency Diesel Generators</b> / Respond To An Emergency Diesel Generator Failure To Load	N, S, L, A	6
h. <b>Nuclear Instrumentation System</b> / Return A Power Range Nuclear Instrument To Service	N, S	7

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

i. <b>Pressurizer Level Control System</b> / Locally Operate A Charging Pump	D, L	2
j. <b>A.C. Electrical Distribution</b> / Align Alternate AC Power To A Residual Heat Removal Pump.	N, L, R	6
k. <b>Spent Fuel Pool Cooling</b> / Use The Spent Fuel Pool Cooling System To Re-flood The RHR System Suction.	M, L, R	8

\* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: <b>Point Beach Nuclear Plant</b> Exam Level : <b>SRO-I</b>		Date of Examination: <b>9/29-10/3/03</b> Operating Test No: <b>2003301</b>
Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)		
System / JPM Title	Type Code*	Safety Function
a. <b>Control Rod Drive System</b> / Respond To Uncontrolled Rod Motion.	D, S, A	1
b. <b>Chemical &amp; Volume Control System</b> / Manually Makeup To The VCT.	M, S, A	2
c. <b>Emergency Core Cooling System</b> / Fill An Accumulator Gas Space.	D, S	3
d. <b>Reactor Coolant Pump System</b> / Start A Reactor Coolant Pump (last NRC exam)	D, S, L	4 (primary)
e. <b>Auxiliary Feedwater System</b> / Raise Steam Generator Level Using Auxiliary Feedwater	N, S, L, A	4 (secondary)
f. <b>Containment Spray System</b> / Secure Containment Spray	D, S, L (ESF)	5
g. <b>Emergency Diesel Generators</b> / Respond To An Emergency Diesel Generator Failure To Load	N, S, L, A	6
h. N/A	N/A	N/A
In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
i. <b>Pressurizer Level Control System</b> / Locally Operate A Charging Pump	D, L	2
j. <b>A.C. Electrical Distribution</b> / Align Alternate AC Power To A Residual Heat Removal Pump.	N, L, R	6
k. <b>Spent Fuel Pool Cooling</b> / Use The Spent Fuel Pool Cooling System To Re-flood The RHR System Suction.	M, L, R	8
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA		

Facility: Point BeachScenario No.: 1OP-Test No.: 2003301Examiners: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_Operators: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_**Initial Conditions:** Unit 1 is at 100% Power, MOL, equilibrium xenon conditions. Unit 2 is at 100% Power.**Turnover:** G-02 EDG is out of service for annual maintenance. It was taken OOS 2 days ago, and is expected to be returned to service in 3 days. G-01 EDG is aligned to 4.16 kV buses 1A-05 and 2A-05 IAW OI-35A.1P-2C Charging Pump is out of service due to a failed motor bearing. The failure occurred 16 hours ago and has been tagged out for repair.1P-15A Safety Injection Pump has just been tagged out (4 hours ago) due to high vibration that was identified during In-service Testing. The pump is not available.Today is Sunday, present clock time is real time. A normal shift complement is available with exception of the 3<sup>rd</sup> SRO. An RP Tech is on-site along with two mechanics who are working on the diesel. A maintenance crew has just been called in for 1P-15A.The objective of the shift is to maintain stable plant conditions.

Event No.	Malf. No.	Event Type*	Event Description
1		C – BOP SRO	Service Water Pump Trip.
2		I – RO SRO	Controlling Pressurizer Pressure channel PT-431 fails high.
3		C – RO SRO	1P-2A Charging Pump belt failure.
4		I – RO SRO	Turbine First Stage Pressure Transmitter PT-485 fails low.
5		M – All	RCS Leak develops to SBLOCA, requiring reactor trip.
6		C – RO SRO	Reactor trip breakers fail to open – (ATWS).
7		C – BOP SRO	Safety Injection Pump 1P-15B fails to start.

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

Facility: **Point Beach**Scenario No.: **2**OP-Test No.: **2003301**

Examiners: \_\_\_\_\_

Operators: \_\_\_\_\_

**Initial Conditions:** Unit 1 is at 75% power. Power was reduced approximately 6 hours ago at the request of the Power System Supervisor. Xenon is building in slightly. Unit 2 is at 100% Power.

**Turnover:** G-02 EDG is out of service for annual maintenance. It was taken OOS 2 days ago, and is expected to be returned to service in 3 days. G-01 EDG is aligned to 4.16 kV buses 1A-05 and 2A-05 IAW OI-35A.

1P-2C Charging Pump is out of service due to a failed motor bearing. The failure occurred 16 hours ago and has been tagged out for repair.

1P-15A Safety Injection Pump has just been tagged out (4 hours ago) due to high vibration that was identified during scheduled In-service Testing. The pump is not available.

Today is Sunday, present clock time is real time. A normal shift complement is available with exception of the 3<sup>rd</sup> SRO. An RP Tech is on-site along with two mechanics who are working on the diesel. A maintenance crew has just been called in for 1P-15A.

The objective of the shift is to maintain stable plant conditions until the Power System Supervisor requests power be returned to 100%.

Event No.	Malf. No.	Event Type*	Event Description
1		I – BOP SRO	Steam Generator Steam Flow Transmitter 1FT-474 fails high.
2		C – BOP SRO	Running CCW pump trips, with failure of standby to start.
3		I – RO SRO	Letdown line pressure controller 1HC-135 fails (oscillating in Auto/Man).
4		C – RO SRO	Steam Generator 'B' Tube Leak develops.
5		R – RO N – BOP N – SRO	Power reduction initiated due to tube leak.
6		M– ALL	Tube leak increases to rupture requiring reactor trip.
7		C – RO SRO	Main turbine fails to auto-trip.
8		M– ALL	Steam Leak develops on Steam Generator 'B'.
9		C – BOP SRO	Steam Generator 'B' Blowdown Valve fails to isolate.

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

Facility: **Point Beach Nuclear Plant**Date of Exam: **Sep 29, 2003**

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	K	A	A 2	G *	Total
1. Emergency & Abnormal Plant Evolutions	1	4	1	5	NA	NA	NA	2	4	NA	NA	2	18					7
	2	1	1	1	NA	NA	NA	2	3	NA	NA	1	9					5
		-	-	-	-	-	-	-	-	-	-	-	-					
	Tier Totals	5	2	6	NA	NA	NA	4	7	NA	NA	3	27					12
2. Plant Systems	1	5	2	3	1	2	3	1	3	4	1	3	28					4
	2	0	1	0	1	0	0	1	4	0	2	1	10					2
		-	-	-	-	-	-	-	-	-	-	-	-					
	Tier Totals	5	3	3	2	2	3	2	7	4	3	4	38					6
3. Generic Knowledge and Abilities Categories					1	2	3	4	10					1	2	3	4	7
					2	3	3	2										

- Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO outline (i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding SRO sampling.
  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  $\pm 1$  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. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system or evolution unless they relate to plant-specific priorities.
  4. Systems/evolutions within each group are identified on the associated outline.
  5. The shaded areas are not applicable to the category/tier.
  6. \* 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. The SRO K/As must also be linked to 10 CFR 55.43 or an SRO-level learning objective.
  7. 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; summarize all the SRO-only knowledge and non-A2 ability categories in the columns labeled "K" and "A". Use duplicate pages for RO and SRO-only exams.
  8. For Tier 3, enter the K/A numbers, descriptions, importance ratings, and point totals on Form ES-401-3.
  9. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.



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 (BW/E02&E10; CE/E02) Reactor Trip – Stabilization – Recovery / 1						X	<b>2.4.31</b> Knowledge of annunciators alarms and indications, and use of the response instructions	3.3	1
000008 Pressurizer Vapor Space Accident (Relief Valve Stuck Open) / 3			X				<b>008.AK3.03</b> Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident (Relief Valve Stuck Open): Actions contained in EOP for PZR vapor space accident / LOCA	4.1	2
000009 Small Break LOCA / 3					X		<b>009.EA2.34</b> Ability to determine or interpret the following as they apply to a small break LOCA: Conditions for throttling or stopping HPI	3.6	3
000011 Large Break LOCA / 3		X					<b>011.EK2.02</b> Knowledge of the interrelations between Large Break LOCA and the following: Pumps	2.6	4
000015/17 RCP Malfunctions / 4			X				<b>015.AK3.02</b> Knowledge of the reasons for the following responses as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): CCW lineup and flow paths to RCP oil coolers	3.0	5
000022 Loss of Rx Coolant Makeup / 2			X				<b>022.AK3.02</b> Knowledge of the reasons for the following responses as they apply to the Loss of Reactor Coolant Pump Makeup: Actions contained in SOPs and EOPs for RCPs, loss of makeup, loss of charging, and abnormal charging	3.5	6
000025 Loss of RHR System / 4	X						<b>025.AK1.01</b> Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: Loss of RHRS during all modes of operation	3.9	7
000026 Loss of Component Cooling Water / 8			X				<b>026.AK3.02</b> Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: The automatic actions (alignments) within the CCWS resulting from the actuation of the ESFAS	3.6	8
000027 Pressurizer Pressure Control System Malfunction / 3	X						<b>027.AK1.01</b> Knowledge of the operational implications of the following concepts as they apply to Pressurizer Pressure Control Malfunctions: Definition of saturation temperature	3.1	9
000029 ATWS / 1									
000038 Steam Gen. Tube Rupture / 3					X		<b>038.EA2.17</b> Ability to determine or interpret the following as they apply to a SGTR: RCP restart criteria	3.8	10
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture – Excessive Heat Transfer / 4					X		<b>040.AA2.05</b> Ability to determine and interpret the following as they apply to the Steam Line Rupture: When ESFAS systems may be secured	4.1	11

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	#
000054 (CE/E06) Loss of Main Feedwater / 4					X		<b>054.AA2.05</b> Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): Status of MFW pumps, regulating and stop valves	3.5	12
000055 Station Blackout / 6									
000056 Loss of Off-site Power / 6				X			<b>056.AA1.31</b> Ability to operate and/or monitor the following as they apply to the Loss of Offsite Power: PZR heater group control switches	3.3	13
000057 Loss of Vital AC Inst. Bus / 6									
000058 Loss of DC Power / 6									
000062 Loss of Nuclear Svc Water / 4						X	<b>2.4.31</b> Knowledge of annunciators alarms and indications, and use of the response instructions	3.3	14
000065 Loss of Instrument Air / 8			X				<b>065.AK3.03</b> Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Knowing effects on plant operation of isolating certain equipment from instrument air	2.9	15
W/E04 LOCA Outside Containment / 3	X						<b>W/E04.EK1.3</b> Knowledge of the operational implications of the following concepts as they apply to the (LOCA Outside Containment): Annunciators and conditions indicating signals, and remedial actions associated with the (LOCA Outside Containment)	3.5	16
W/E11 Loss of Emergency Coolant Recirc. / 4	X						<b>W/E11.EK1.3</b> Knowledge of the operational implications of the following concepts as they apply to the (Loss of Emergency Coolant Recirculation): Annunciators and conditions indicating signals, and remedial actions associated with the (Loss of Emergency Coolant Recirculation)	3.6	17
BW/E04; W/E05 Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4				X			<b>W/E05.EA1.1</b> Ability to operate and/or monitor the following as they apply to the (Loss of Secondary Heat Sink): Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	4.1	18
K/A Category Totals:	4	1	5	2	4	2	Group Point Total:		18

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (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	#
000001 Continuous Rod Withdrawal / 1	X						<b>001.AK1.08</b> Knowledge of the operational implications of the following concepts as they apply to Continuous Rod Withdrawal: Control rod motion on S/G pressure.	2.9	19
000003 Dropped Control Rod / 1									
000005 Inoperable/Stuck Control Rod / 1					X		<b>005.AA2.03</b> Ability to determine and interpret they following as they apply to the Inoperable/Stuck Control Rod: Required actions if more than one rod is stuck or inoperable.	3.5	20
000024 Emergency Boration / 1		X					<b>024.AK2.04</b> Knowledge of the interrelations between the Emergency Boration and the following: Pumps	2.6	21
000028 Pressurizer Level Malfunction / 2									
000032 Loss of Source Range NI / 7									
000033 Loss of Intermediate Range NI / 7						X	<b>2.1.23</b> Ability to perform specific system and integrated plant procedures during all modes of plant operations	3.9	22
000036 (BW/A08) Fuel Handling Accident / 8									
000037 Steam Generator Tube Leak / 3									
000051 Loss of Condenser Vacuum / 4									
000059 Accidental Liquid Radwaste Release / 9									
000060 Accidental Gaseous Radwaste Release / 9									
000061 ARM System Alarms / 7									
000067 Plant Fire On-site / 8									
000068 (BW/A06) Control Room Evacuation / 8									
000069 (W/E14) Loss of Containment Integrity / 5			X				<b>069.AK3.01</b> Knowledge of the reasons for the following responses as they apply to the Loss of Containment Integrity: Guidance contained in EOP for loss of containment integrity	3.8	23
000074 (W/E06&E07) Inadequate Core Cooling / 4									
000076 High Reactor Coolant Activity / 9				X			<b>076.AA1.04</b> Ability to operate and/or monitor the following as they apply to the High Reactor Coolant Activity: Failed fuel-monitoring equipment	3.2	24
W/E01 & E02 Rediagnosis & SI Termination / 3					X		<b>W/E02.EA2.1</b> Ability to determine and interpret they following as they apply to the (SI Termination): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	3.3	25
W/E13 Steam Generator Over-pressure / 4				X			<b>W/E13.EA1.2</b> Ability to operate and/or monitor the following as they apply to the (Steam Generator Overpressure): Operating behavior characteristics of the facility	3.0	26

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (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	#
W/E15 Containment Flooding / 5									
W/E16 High Containment Radiation / 9									
BW/A01 Plant Runback / 1									
BW/A02&A03 Loss of NNI-X/Y / 7									
BW/A04 Turbine Trip / 4									
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8									
BW/E03 Inadequate Subcooling Margin / 4									
BW/E08; W/E03 LOCA Cooldown and Depressurization / 4					X		<b>W/E03.EA2.2</b> Ability to determine and interpret the following as they apply to the (LOCA Cooldown and Depressurization): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	3.5	27
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4									
BW/E13&E14 EOP Rules and Enclosures									
CE/A11; W/E08 RCS Overcooling – PTS / 4									
CE/A16 Excess RCS Leakage / 2									
CE/E09 Functional Recovery									
K/A Category Point Totals:	1	1	1	2	3	1	Group Point Total:		9

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	#
003 Reactor Coolant Pump			X							X		<b>003.K3.01</b> Knowledge of the effect that a loss or malfunction of the RCPS will have on the following: RCS	3.7	28
												<b>003.A3.01</b> Ability to monitor automatic operation of the RCPS, including: Seal injection flow	3.3	29
004 Chemical and Volume Control						X						<b>004.K6.31</b> Knowledge of the effect of a loss or malfunction on the following CVCS components: Seal injection system and limits on flow range	3.1	30
005 Residual Heat Removal		X										<b>005.K2.01</b> Knowledge of bus power supplies to the following: RHR pumps	3.0	31
006 Emergency Core Cooling						X						<b>006.K6.18</b> Knowledge of the effect of a loss or malfunction on the following will have on the ECCS: Subcooling margin indicators	3.6	32
007 Pressurizer Relief/Quench Tank	X											<b>007.K1.01</b> Knowledge of the physical connections and/or cause-effect relationships between the PRTS and the following systems: Containment system	2.9	33
008 Component Cooling Water							X					<b>008.A1.04</b> Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCSW controls including: Surge tank level	3.1	34
010 Pressurizer Pressure Control						X					X	<b>010.K6.04</b> Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: PRT	2.9	35
												<b>010.A4.03</b> Ability to manually operate and/or monitor in the control room: PORV and block valves	4.0	36
012 Reactor Protection								X				<b>012.A2.06</b> Ability to (a) predict the impacts of the following malfunctions or operations on the RPS: and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure of RPS signal to trip the reactor	4.4	37
013 Engineered Safety Features Actuation											X	<b>2.4.4</b> Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.0	38
022 Containment Cooling											X	<b>2.1.27</b> Knowledge of system purpose and/or function	2.8	39
025 Ice Condenser														

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	#
026 Containment Spray										X			<b>026.A3.01</b> Ability to monitor automatic operation of the CSS, including: Pump starts and correct MOV positioning	4.3	40
039 Main and Reheat Steam		X		X									<b>039.K1.07</b> Knowledge of the physical connections and/or cause-effect relationships between the MRSS and the following systems: AFW	3.4	41
													<b>039.K3.06</b> Knowledge of the effect that a loss or malfunction of the MRSS will have on the following: SDS	2.8	42
056 Condensate		X								X			<b>056.K1.03</b> Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and the following systems: MFW	2.6	43
													<b>056.A2.04</b> Ability to (a) predict the impacts of the following malfunctions or operations on the Condensate System: and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of condensate pumps	2.6	44
059 Main Feedwater		X											<b>059.K1.02</b> Knowledge of the physical connections and/or cause-effect relationships between the MFW and the following systems: AFW system	3.4	45
061 Auxiliary/Emergency Feedwater						X						X	<b>061.K5.02</b> Knowledge of the operational implications of the following concepts as they apply to the AFW: Decay heat sources and magnitude	3.2	46
													<b>2.2.22</b> Knowledge of limiting conditions for operations and safety limits	3.4	47
062 AC Electrical Distribution										X			<b>062.A3.01</b> Ability to monitor automatic operation of the AC distribution system, including: Vital AC bus amperage	3.0	48
063 DC Electrical Distribution										X			<b>063.A3.01</b> Ability to monitor automatic operation of the DC electrical system, including: Meters, annunciators, dials, recorders, and indicating lights	2.7	49
064 Emergency Diesel Generator					X								<b>064.K4.02</b> Knowledge of ED/G system design feature(s) and/or interlock(s) which provide for the following: Trips for ED/G while operating (normal or emergency)	3.9	50
073 Process Radiation Monitoring						X							<b>073.K5.01</b> Knowledge of the operational implications as they apply to concepts as they apply to the PRM system: Radiation theory, including sources, types, units, and effects	2.5	51

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	#
076 Service Water		X											076.K1.08 Knowledge of the physical connections and/or cause-effect relationships between the SWS and the following systems: RHR system	3.5	52
078 Instrument Air			X										078.K2.01 Knowledge of bus power supplies to the following: Instrument air compressor	2.7	53
103 Containment													103.K3.01 Knowledge of the effect that a loss or malfunction of the containment system will have on the following: Loss of containment integrity under shutdown conditions	3.3	54
				X					X				103.A2.04 Ability to (a) predict the impacts of the following malfunctions or operations on the containment system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Containment evacuation (including recognition of the alarm).	3.5	55
K/A Category Point Totals:		5	2	3	1	2	3	1	3	4	1	3	Group Point Total:		28

ES-401		PWR Examination Outline Plant Systems – Tier 2/Group 2 (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	#
001 Control Rod Drive															
002 Reactor Coolant												X	2.4.6 Knowledge of symptom based EOP mitigation strategies	3.1	56
011 Pressurizer Level Control									X				011.A2.06 Ability to (a) predict the impacts of the following malfunctions or operations on the PZR LCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Isolation of letdown	3.0	57
014 Rod Position Indication					X								014.K4.03 Knowledge of RPIS design feature(s) and/or interlock(s) which provide for the following: Rod bottom lights	3.2	58
015 Nuclear Instrumentation			X										015.K2.01 Knowledge of bus power supplies to the following: NIS channels, components, and interconnections	3.3	59
016 Non-nuclear Instrumentation											X		016.A4.02 Ability to manually operate and/or monitor in the control room: Recorders	2.7	60
017 In-core Temperature Monitor															
027 Containment Iodine Removal															
028 Hydrogen Recombiner and Purge Control															
029 Containment Purge															
033 Spent Fuel Pool Cooling									X				033.A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Abnormal spent fuel pool water level or loss of water level	3.1	61
034 Fuel Handling Equipment															
035 Steam Generator															
041 Steam Dump/Turbine Bypass Control															
045 Main Turbine Generator									X				045.A2.17 Ability to (a) predict the impacts of the following malfunctions or operation on the MT/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Malfunction of electrohydraulic control	2.7	62



ES-401		PWR Examination Outline Plant Systems – Tier 2/Group 2 (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	#
055 Condenser Air Removal														
068 Liquid Radwaste										X		068.A4.04 Ability to manually operate and/or monitor in the control room: Automatic isolation	3.8	63
071 Waste Gas Disposal							X					071.A1.06 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with Waste Gas Disposal System operating the controls including: Ventilation system	2.5	64
072 Area Radiation Monitoring														
075 Circulating Water														
079 Station Air														
086 Fire Protection							X					086.A2.04 Ability to (a) predict the impacts of the following malfunctions or operations of the Fire Protection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure to actuate the FPS when required, resulting in fire damage	3.3	65
K/A Category Point Totals:	0	1	0	1	0	0	1	4	0	2	1	Group Point Total:		10

ES-401		Generic Knowledge and Abilities Outline (Tier 3)			Form ES-401-3	
Facility: <b>Point Beach Nuclear Plant</b>		Date of Exam: <b>Sep 29, 2003</b>				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	<b>2.1.33</b>	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	3.4	66		
	<b>2.1.17</b>	Ability to make accurate, clear and concise verbal reports	3.5	67		
	Subtotal			2		
2. Equipment Control	<b>2.2.22</b>	Knowledge of limiting conditions for operations and safety limits	3.4	68		
	<b>2.2.33</b>	Knowledge of control rod programming	2.5	69		
	<b>2.2.27</b>	Knowledge of the refueling process	2.6	70		
	Subtotal			3		
3. Radiation Control	<b>2.3.1</b>	Knowledge of 10 CFR: 20 and related facility radiation control requirements	2.6	71		
	<b>2.3.4</b>	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized	2.5	72		
	<b>2.3.11</b>	Ability to control radiation releases	2.7	73		
	Subtotal			3		

ES-401	Generic Knowledge and Abilities Outline (Tier 3)				Form ES-401-3	
Facility: <b>Point Beach Nuclear Plant</b>		Date of Exam: <b>Sep 29, 2003</b>				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
4. Emergency Procedures / Plan	<b>2.4.31</b>	Knowledge of annunciators alarms and indications, and use of the response instructions	3.3	74		
	<b>2.4.9</b>	Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies	3.3	75		
	Subtotal			2		
Tier 3 Point Total				10		

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	000008 / AK3.02	Fundamentals question - Selected AK3.03
1/1	000011 / K3	No K2's selected for tier 1 – Selected EK2.02
1/1	000026 / K1	No K1 statements – Selected AK3.01
	AK3.01	N/A to PBNP – Selected AK3.02
1/1	000062 / K2	No K2 statements – Selected G2.4.31
1/2	000001 / AK3.02	SRO level knowledge – Selected AK1.08
1/2	000024 / K3	No K2's selected for tier 1 – Selected AK2.04
2/1	022 / K5	K/A < 2.5 – Selected G2.1.27
2/1	056 / A1	All K/A's < 2.5 – Selected K1.03
2/1	059 / K5	All K/A's < 2.5 – Selected K1.02
2/1	062 / K6	All K/A's < 2.5 – Selected A3.01
2/1	078 / A2	K/A < 2.5 – Selected K2.01
2/2	014 / K6	All K/A's < 2.5 – Selected K4.03
2/2	016 / K6	K/A < 2.5 – Selected A4.02
2/2	045 / K2	All K/A's < 2.5 – Selected A2.17
2/2	068 / A1	All K/A's < 2.5 – Selected A4.02
3	2 / 2.2.11	SRO level knowledge – Selected 2.2.27
3	3 / 2.3.8	K/A < 2.5 – Selected 2.3.1
3	3 / 2.3.5	K/A < 2.5 – Selected 2.3.3
	2.3.3	K/A < 2.5 – Selected 2.3.4
3	3 / 2.3.7	K/A < 2.5 – Selected 2.3.11
3	4 / 2.4.37	K/A < 2.5 – Selected 2.4.31
3	4 / 2.4.28	K/A < 2.5 – Selected 2.4.9
2/2	011 / A2.06	Unable to write question to K/A, selected next K/A in sequence, 011.A2.07

Facility: **Point Beach Nuclear Plant**Date of Exam: **Sep 29, 2003**

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	K	A	A 2	G *	Total
1. Emergency & Abnormal Plant Evolutions	1	4	1	5	NA	NA	NA	2	4	NA	NA	2	18	1	0	4	2	7
	2	1	1	1	NA	NA	NA	2	3	NA	NA	1	9	3	0	2	0	5
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tier Totals	5	2	6	NA	NA	NA	4	7	NA	NA	3	27	4	0	6	2	12
2. Plant Systems	1	5	2	3	1	2	3	1	3	4	1	3	28	0	2	1	1	4
	2	0	1	0	1	0	0	1	4	0	2	1	10	0	1	0	1	2
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tier Totals	5	3	3	2	2	3	2	7	4	3	4	38	0	3	1	2	6
3. Generic Knowledge and Abilities Categories				1		2		3		4		10	1	2	3	4	7	
				2		3		3		2			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 outline (i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding SRO sampling.
  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  $\pm 1$  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. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system or evolution unless they relate to plant-specific priorities.
  4. Systems/evolutions within each group are identified on the associated outline.
  5. The shaded areas are not applicable to the category/tier.
  6. \* 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. The SRO K/As must also be linked to 10 CFR 55.43 or an SRO-level learning objective.
  7. 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; summarize all the SRO-only knowledge and non-A2 ability categories in the columns labeled "K" and "A". Use duplicate pages for RO and SRO-only exams.
  8. For Tier 3, enter the K/A numbers, descriptions, importance ratings, and point totals on Form ES-401-3.
  9. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (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 (BW/E02&E10; CE/E02) Reactor Trip – Stabilization – Recovery / 1						X	<b>2.4.30</b> Knowledge of which events related to system operations/status should be reported to outside agencies.	3.6	1/76
000008 Pressurizer Vapor Space Accident / 3									
000009 Small Break LOCA / 3									
000011 Large Break LOCA / 3									
000015/17 RCP Malfunctions / 4						X	<b>2.1.12</b> Ability to apply Technical Specifications for a system.	4.0	2/77
000022 Loss of Rx Coolant Makeup / 2									
000025 Loss of RHR System / 4									
000026 Loss of Component Cooling Water / 8									
000027 Pressurizer Pressure Control System Malfunction / 3					X		<b>027.AA2.10</b> Ability to determine and interpret the following as they apply to the Pressurizer Pressure Control Malfunctions: PZR heater energized/de-energized condition	3.6	3/78
000029 ATWS / 1									
000038 Steam Gen. Tube Rupture / 3			X				<b>038.EK3.09</b> Knowledge of the reasons for the following responses as they apply to the SGTR: Criteria for securing/throttling ECCS.	4.5	4/79
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture – Excessive Heat Transfer / 4									
000054 (CE/E06) Loss of Main Feedwater / 4									
000055 Station Blackout / 6					X		<b>055.EA2.03</b> Ability to determine or interpret the following as they apply to a Station Blackout: Actions necessary to restore power.	4.7	5/80
000056 Loss of Off-site Power / 6									
000057 Loss of Vital AC Inst. Bus / 6									
000058 Loss of DC Power / 6									
000062 Loss of Nuclear Svc Water / 4									
000065 Loss of Instrument Air / 8									
W/E04 LOCA Outside Containment / 3					X		<b>W/E04.EA2.2</b> Ability to determine and interpret the following as they apply to the (LOCA Outside Containment): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	4.2	6/81
W/E11 Loss of Emergency Coolant Recirc. / 4					X		<b>W/E11.EA2.2</b> Ability to determine and interpret the following as they apply to the (Loss of Emergency Coolant Recirculation): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	4.2	7/82

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (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	#
BW/E04; W/E05 Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4									
K/A Category Totals:	0	0	1	0	4	2	Group Point Total:		7

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (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	#
000001 Continuous Rod Withdrawal / 1									
000003 Dropped Control Rod / 1									
000005 Inoperable/Stuck Control Rod / 1	X						<b>005.AK1.02</b> Knowledge of the operational implications of the following concepts as they apply to Inoperable/Stuck Control Rod: Flux tilt.	3.9	8/83
000024 Emergency Boration / 1									
000028 Pressurizer Level Malfunction / 2					X		<b>028.AA2.12</b> Ability to determine and interpret the following as they apply to the Pressurizer Level Control Malfunctions: Cause for PZR level deviation alarm: controller malfunction or other instrumentation malfunction	3.5	9/84
000032 Loss of Source Range NI / 7									
000033 Loss of Intermediate Range NI / 7									
000036 (BW/A08) Fuel Handling Accident / 8									
000037 Steam Generator Tube Leak / 3									
000051 Loss of Condenser Vacuum / 4									
000059 Accidental Liquid RadWaste Rel. / 9									
000060 Accidental Gaseous Radwaste Rel. / 9			X				<b>060.AK3.01</b> Knowledge of the reasons for the following responses as they apply to the Accidental Gaseous Radwaste: Implementations of E-plan	4.2	10/85
000061 ARM System Alarms / 7									
000067 Plant Fire On-site / 8									
000068 (BW/A06) Control Room Evac. / 8									
000069 (W/E14) Loss of CTMT Integrity / 5									
000074 (W/E06&E07) Inad. Core Cooling / 4									
000076 High Reactor Coolant Activity / 9									
W/E01 & E02 Rediagnosis & SI Termination / 3									
W/E13 Steam Generator Over-pressure / 4									
W/E15 Containment Flooding / 5									
W/E16 High Containment Radiation / 9					X		<b>W/E16.EA2.2</b> Ability to determine and interpret the following as they apply to the (High Containment Radiation): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.3	11/86
BW/A01 Plant Runback / 1									
BW/A02&A03 Loss of NNI-X/Y / 7									
BW/A04 Turbine Trip / 4									



ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (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	#
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8									
BW/E03 Inadequate Subcooling Margin / 4									
BW/E08; W/E03 LOCA Cooldown – Depress. / 4									
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4			X				W/E09.EK3.4 Knowledge of the reasons for the following responses as they apply to the (Natural Circulation Operations): RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated	3.6	12/87
BW/E13&E14 EOP Rules and Enclosures									
CE/A11; W/E08 RCS Overcooling – PTS / 4									
CE/A16 Excess RCS Leakage / 2									
CE/E09 Functional Recovery									
K/A Category Point Totals:	1	0	2	0	2	0	Group Point Total:		5

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	#
003 Reactor Coolant Pump															
004 Chemical and Volume Control								X					004.A1.11 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CVCS controls including: Letdown and charging flows	3.0	13/88
005 Residual Heat Removal												X	2.2.25 Knowledge and bases in technical specifications for limiting conditions for operations and safety limits	3.7	14/89
006 Emergency Core Cooling															
007 Pressurizer Relief/Quench Tank															
008 Component Cooling Water									X				008.A2.02 Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: High/low surge tank level	3.5	15/90
010 Pressurizer Pressure Control															
012 Reactor Protection															
013 Engineered Safety Features Actuation															
022 Containment Cooling															
025 Ice Condenser															
026 Containment Spray								X					026.A1.01 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CSS controls including: Containment pressure	4.2	16/91
039 Main and Reheat Steam															
056 Condensate															
059 Main Feedwater															
061 Auxiliary/Emergency Feedwater															
062 AC Electrical Distribution															
063 DC Electrical Distribution															
064 Emergency Diesel Generator															
073 Process Radiation Monitoring															
076 Service Water															
078 Instrument Air															

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	#
103 Containment														
K/A Category Point Totals:							2	1			1	Group Point Total:		4

ES-401		PWR Examination Outline Plant Systems – Tier 2/Group 2 (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	#
001 Control Rod Drive														
002 Reactor Coolant														
011 Pressurizer Level Control							X					011.A1.04 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR LCS controls including: T-ave	3.3	17/92
014 Rod Position Indication														
015 Nuclear Instrumentation														
016 Non-nuclear Instrumentation														
017 In-core Temperature Monitor														
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control														
029 Containment Purge														
033 Spent Fuel Pool Cooling														
034 Fuel Handling Equipment														
035 Steam Generator														
041 Steam Dump/Turbine Bypass Control											X	2.1.10 Knowledge of conditions and limitations in the facility license.	3.9	18/93
045 Main Turbine Generator														
055 Condenser Air Removal														
068 Liquid Radwaste														
071 Waste Gas Disposal														
072 Area Radiation Monitoring														
075 Circulating Water														
079 Station Air														
086 Fire Protection														
K/A Category Point Totals:							1				1	Group Point Total:		2

ES-401		Generic Knowledge and Abilities Outline (Tier 3)			Form ES-401-3	
Facility: <b>Point Beach Nuclear Plant</b>			Date of Exam: <b>Sep 29, 2003</b>			
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.5	Ability to locate and use procedures and directives related to shift staffing and activities.			3.4	19/94
	2.1.9	Ability to direct personnel activities inside the control room			4.0	20/95
	Subtotal					2
2. Equipment Control	2.2.22	Knowledge of limiting conditions for operations and safety limits.			4.1	21/96
	2.2.24	Ability to analyze the effects of maintenance activities on LCO status.			3.8	22/97
	Subtotal					2
3. Radiation Control	2.3.9	Knowledge of the process for performing a containment purge			3.4	23/98
	Subtotal					1

ES-401		Generic Knowledge and Abilities Outline (Tier 3)				Form ES-401-3		
Facility: <b>Point Beach Nuclear Plant</b>				Date of Exam: <b>Sep 29, 2003</b>				
4. Emergency Procedures / Plan	<b>2.4.14</b>	Knowledge of general guidelines for EOP flowchart use.			3.9	24/99		
	<b>2.4.16</b>	Knowledge of EOP implementation hierarchy and coordination with other support procedures			4.0	25/100		
	Subtotal					2		
Tier 3 Point Total						7		

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	000007 / K2	Not SRO only – Selected K1
	K1	Not SRO only – Selected G2.4.30
1/1	000015/017 / K2	Not SRO only – Selected G2.1.12
1/1	000027 / K1	Not SRO only – Selected A1
	A1	Not SRO only – Selected K2
	K2	Not SRO only – Selected AA2.10
1/1	000038 / A1	Not SRO only – Selected EK3.09
1/1	W/E04 / K1	Not SRO only – Selected A1
	A1	Not SRO only – Selected EA2.2
1/2	000005 / AA2.03	Previously selected in RO outline, selected AK1.02
1/2	000060 / AK3.04	Not SRO only – Selected AK3.01
2/1	005 / K5	Not SRO only – Selected K1
	K1	Not SRO only – Selected G2.2.25
2/1	008 / K5	All K/As < 2.5 – Selected K6
	K6	All K/As < 2.5 -- Selected A2.09
2/2	011 / A3	Not SRO only – Selected K5
	K5	Not SRO only – Selected A1.04
3	3 / 2.3.4	Previously selected in RO outline – Selected 2.3.1
	2.3.1	Previously selected in RO outline – Selected 2.3.9
4	4 / 2.4.2	Not SRO only – selected 2.4.14
2/1	008 / A2.09	Unable to write SRO level question – selected A2.02