

**Facility:** Robert E Ginna

Printed: 01/24/2013

Date Of Exam: 04/22/2013

Tier	Group	RO K/A Category Points												SRO-Only Points				
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2		G*	Total	
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A			3	18	0		0	0
	2	1	1	3				1	2				1	9	0		0	0
	Tier Totals	4	4	6				4	5				4	27	0		0	0
2.  Plant Systems	1	3	2	3	3	2	2	2	3	2	3	3	28	0		0	0	
	2	1	1	1	1	1	0	1	1	1	1	1	10	0	0	0	0	
	Tier Totals	4	3	4	4	3	2	3	4	3	4	4	38	0		0	0	
3. Generic Knowledge And Abilities Categories				1		2		3		4		10		1	2	3	4	0
				3		2		2		3				0	0	0	0	

**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  $\pm 1$  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.
- 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.

# PWR RO Examination Outline

Printed: 01/24/2013

Facility: Robert E Ginna

ES - 401                      Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1                      Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000008 Pressurizer Vapor Space Accident / 3		X					AK2.02 - Sensors and detectors	2.7*	1
000009 Small Break LOCA / 3					X		EA2.36 - Difference between overcooling and LOCA indications	4.2	1
000011 Large Break LOCA / 3				X			EA1.07 - Containment isolation system	4.4	1
000015/000017 RCP Malfunctions / 4			X				AK3.04 - Reduction of power to below the steady state power-to-flow limit	3.1*	1
000022 Loss of Rx Coolant Makeup / 2					X		AA2.01 - Whether charging line leak exists	3.2	1
000025 Loss of RHR System / 4			X				AK3.01 - Shift to alternate flowpath	3.1	1
000026 Loss of Component Cooling Water / 8				X			AA1.06 - Control of flow rates to components cooled by the CCWS	2.9	1
000029 ATWS / 1		X					EK2.06 - Breakers, relays, and disconnects	2.9*	1
000038 Steam Gen. Tube Rupture / 3						X	2.4.1 - Knowledge of EOP entry conditions and immediate action steps.	4.6	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4		X					AK2.02 - Sensors and detectors	2.6*	1
000054 Loss of Main Feedwater / 4	X						AK1.02 - Effects of feedwater introduction on dry S/G	3.6	1
000055 Station Blackout / 6						X	2.2.38 - Knowledge of conditions and limitations in the facility license.	3.6	1
000056 Loss of Off-site Power / 6						X	2.1.28 - Knowledge of the purpose and function of major system components and controls.	4.1	1
000058 Loss of DC Power / 6					X		AA2.03 - DC loads lost; impact on to operate and monitor plant systems	3.5	1
000062 Loss of Nuclear Svc Water / 4				X			AA1.07 - Flow rates to the components and systems that are serviced by the SWS; interactions among the components	2.9	1
W/E04 LOCA Outside Containment / 3	X						EK1.2 - Normal, abnormal and emergency operating procedures associated with LOCA Outside Containment	3.5	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	X						EK1.1 - Components, capacity, and function of emergency systems	3.8	1
W/E11 Loss of Emergency Coolant Recirc. / 4			X				EK3.2 - Normal, abnormal and emergency operating procedures associated with Loss of Emergency Coolant Recirculation	3.5	1

# PWR RO Examination Outline

Printed: 01/24/2013

Facility: Robert E Ginna

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:	18	

# PWR RO Examination Outline

Printed: 01/24/2013

Facility: Robert E Ginna

ES - 401                      Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2                      Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000051 Loss of Condenser Vacuum / 4				X			AA1.04 - Rod position	2.5*	1
000060 Accidental Gaseous Radwaste Rel. / 9			X				AK3.02 - Isolation of the auxiliary building ventilation	3.3*	1
000061 ARM System Alarms / 7			X				AK3.02 - Guidance contained in alarm response for ARM system	3.4	1
000074 Inad. Core Cooling / 4		X					EK2.03 - AFW pump	4.0	1
000076 High Reactor Coolant Activity / 9						X	2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm.	4.1	1
W/E02 SI Termination / 3			X				EK3.1 - Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics	3.3	1
W/E03 LOCA Cooldown - Depress. / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.5	1
W/E08 RCS Overcooling - PTS / 4					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.4	1
W/E10 Natural Circ. / 4	X						EK1.1 - Components, capacity, and function of emergency systems	3.3	1
<b>K/A Category Totals:</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>Group Point Total:</b>	<b>9</b>	

# PWR RO Examination Outline

Printed: 01/24/2013

Facility: Robert E Ginna

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
003 Reactor Coolant Pump	X											K1.12 - CCWS	3.0	1
003 Reactor Coolant Pump									X			A3.05 - RCP lube oil and bearing lift pumps	2.7*	1
004 Chemical and Volume Control		X										K2.05 - MOVs	2.7	1
005 Residual Heat Removal	X											K1.09 - RCSO	3.6	1
006 Emergency Core Cooling				X								K4.10 - Redundant pressure meters	3.3	1
007 Pressurizer Relief/Quench Tank			X									K3.01 - Containment	3.3	1
008 Component Cooling Water											X	2.4.34 - Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	4.2	1
008 Component Cooling Water								X				A2.05 - Effect of loss of instrument and control air on the position of the CCW valves that are air operated	3.3*	1
010 Pressurizer Pressure Control			X									K3.03 - ESFAS	4.0	1
012 Reactor Protection						X						K6.11 - Trip setpoint calculators	2.9*	1
013 Engineered Safety Features Actuation						X						K6.01 - Sensors and detectors	2.7*	1
022 Containment Cooling								X				A2.01 - Fan motor over-current	2.5	1
026 Containment Spray	X											K1.02 - Cooling water	4.1	1
039 Main and Reheat Steam					X							K5.08 - Effect of steam removal on reactivity	3.6	1
059 Main Feedwater							X					A1.03 - Power level restrictions for operation of MFW pumps and valves	2.7*	1
059 Main Feedwater											X	2.2.22 - Knowledge of limiting conditions for operations and safety limits.	4.0	1
061 Auxiliary/Emergency Feedwater					X							K5.05 - Feed line voiding and water hammer	2.7	1
062 AC Electrical Distribution				X								K4.05 - Paralleling of ac sources (synchroscope)	2.7*	1
063 DC Electrical Distribution								X				A2.01 - Grounds	2.5	1
063 DC Electrical Distribution			X									K3.02 - Components using DC control power	3.5	1
064 Emergency Diesel Generator							X					A1.02 - Fuel consumption rate with load	2.5	1
064 Emergency Diesel Generator											X	2.2.37 - Ability to determine operability and/or availability of safety related equipment.	3.6	1

# PWR RO Examination Outline

Printed: 01/24/2013

Facility: Robert E Ginna

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
073 Process Radiation Monitoring										X		A4.03 - Check source for operability demonstration	3.1	1
076 Service Water										X		A4.01 - SWS pumps	2.9	1
076 Service Water		X										K2.01 - Service water	2.7*	1
078 Instrument Air									X			A3.01 - Air pressure	3.1	1
103 Containment										X		A4.04 - Phase A and phase B resets	3.5*	1
103 Containment				X								K4.04 - Personnel access hatch and emergency access hatch	2.5	1
<b>K/A Category Totals:</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>Group Point Total:</b>	<b>28</b>	

# PWR RO Examination Outline

Printed: 01/24/2013

Facility: Robert E Ginna

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
001 Control Rod Drive											X	2.1.30 - Ability to locate and operate components, including local controls.	4.4	1
002 Reactor Coolant							X					A1.08 - RCS average temperature	3.7	1
014 Rod Position Indication								X				A2.04 - Misaligned rod	3.4	1
015 Nuclear Instrumentation		X										K2.01 - NIS channels, components, and interconnections	3.3	1
027 Containment Iodine Removal					X							K5.01 - Purpose of charcoal filters	3.1*	1
029 Containment Purge	X											K1.03 - Engineered safeguards	3.6	1
034 Fuel Handling Equipment				X								K4.03 - Overload protection	2.6	1
055 Condenser Air Removal			X									K3.01 - Main condenser	2.5	1
068 Liquid Radwaste									X			A3.02 - Automatic isolation	3.6	1
075 Circulating Water										X		A4.01 - Emergency/essential SWS pumps	3.2*	1
<b>K/A Category Totals:</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>Group Point Total: 10</b>		

# Generic Knowledge and Abilities Outline (Tier 3)

## PWR RO Examination Outline

Printed: 01/24/2013

**Facility:** Robert E Ginna

**Form ES-401-3**

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
<b>Conduct of Operations</b>	2.1.3	Knowledge of shift or short-term relief turnover practices.	3.7	1
	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.3	1
	2.1.29	Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.	4.1	1
	<b>Category Total:</b>			<b>3</b>
<b>Equipment Control</b>	2.2.13	Knowledge of tagging and clearance procedures.	4.1	1
	2.2.40	Ability to apply Technical Specifications for a system.	3.4	1
	<b>Category Total:</b>			<b>2</b>
<b>Radiation Control</b>	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	1
	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.	3.4	1
	<b>Category Total:</b>			<b>2</b>
<b>Emergency Procedures/Plan</b>	2.4.4	Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	4.5	1
	2.4.18	Knowledge of the specific bases for EOPs.	3.3	1
	2.4.29	Knowledge of the emergency plan.	3.1	1
	<b>Category Total:</b>			<b>3</b>

**Generic Total: 10**





Facility: Robert E. GinnaDate of Examination: April 8, 2013Examination Level: RO ☐ SRO ☒Operating Test Number: **2012 ILT RETAKE**

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D,R	Evaluate data obtained from the latest O-22 cold weather walk down procedure (JS351.001) K/A 2.1.8 3.4 / 4.1 Ability to coordinate personnel activities outside the control room
Conduct of Operations	M,R	Determine Time to Boil for a Loss of Shutdown Cooling K/A 2.1.25 3.9 / 4.2 Ability to interpret reference materials, such as graphs, curves, tables, etc.
Equipment Control	M,R	Fill out an A-52.4 K/A 2.2.23 3.1 / 4.6 Ability to track Technical Specification limiting conditions for operations
Radiation Control	D,R	Approve radioactive waste discharge/release permit K/A 2.3.11 3.8 / 4.3 Ability to control radiation releases.
Emergency Procedures/Plan	D, S or R	Event Classification (JS340.022) K/A 2.4.41 2.9 / 4.6 Knowledge of the emergency action level thresholds and classifications.

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

\* Type Codes &amp; Criteria:

(C)ontrol room, (S)imulator, or Class(R)oom  
 (D)irect from bank ( $\leq 3$  for ROs;  $\leq 4$  for SROs & RO retakes)  
 (N)ew or (M)odified from bank ( $\geq 1$ )  
 (P)revious 2 exams ( $\leq 1$ ; randomly selected)

Facility: <u>Robert E. Ginna</u> Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	Date of Examination: <u>April 8, 2013</u> Operating Test No.: <b>2012 ILT RETAKE</b>	
Control Room Systems® (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
A. Transfer the electric plant from 50-50 Normal to 100/0 Lineup on Circuit 767. 062 A4.01 3.3 / 3.1	N,S,A	6
B. Place the Standby AFW System in service E05 EA1.1 4.1 / 4.0 (2010 NRC)	P,S	4S
C. Place Letdown in Service 004 A4.05 3.6 / 3.1 (JR004.012)	D,S,A	2
D. Perform Immediate Actions of E-0 with SI 007 EA2.02 4.3 / 4.6 (JR012.012)	D,S,A	1
E. Evaluate CNMT Spray flow requirements and reduce flow in E-1 026 A4.01 4.5 / 4.3 (2010 NRC)	P,S	5
F. Startup Containment Mini Purge 029 A2.03 2.7 / 3.1 (JR029.001)	M,S,A	8
G. Defeat a Failed PRZR Pressure Channel 012 A4.05 3.6 / 3.6 (JR012.001)	D,S	7
In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
H. Energize a Minimum of 100 KW Backup heaters onto D/G APE 056 AA1.03 3.2 / 3.3 (JC010.001)	D,R,E	3
I. Perform a manual pumpdown of the RCDT using RCDT Pump A 068 K1.04 2.4* / 2.5*	N,R	9
J. Shift SPF cooling lineup from 'A' to 'B' heat exchangers 033 G2.1.29 4.1 / 4.0	N,R,L	8
@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power / Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator	4-6 / 4-6 / 2-3  $\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ - / - / $\geq 1$ (control room system) $\geq 1 / \geq 1 / \geq 1$ $\geq 2 / \geq 2 / \geq 1$ $\leq 3 / \leq 3 / \leq 2$ (randomly selected) $\geq 1 / \geq 1 / \geq 1$	