Facility: Ginna 2018 Date of Examination: 8/27/2018

Item	Task Description	Initials a	Initials b*	Initials c**
1. WRITTEN	a. Verify that the outline(s) fit(s) the appropriate model in accordance with ES-401 or ES-401N.			
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 or ES-401N and whether all K/A categories are appropriately sampled.	N/A this point in time		
	c. Assess whether the outline overemphasizes any systems, evolutions, or generic topics.			
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.			
2. SIMULATOR	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, technical specifications, and major transients.	PO	N/A	
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity, and ensure that each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s), and that scenarios will not be repeated on subsequent days.	PO		
	c. To the extent possible, assess whether the outline(s) conforms with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D and in Section D.5, "Specific Instructions for the 'Simulator Operating Test,'" of ES-301 (including overlap).	PO		
3. WALKTHROUGH	a. Verify that the systems walkthrough outline meets the criteria specified on Form ES-301-2: (1) The outline(s) contains the required number of control room and in-plant tasks distributed among the safety functions as specified on the form. (2) Task repetition from the last two NRC examinations is within the limits specified on the form. (3) No tasks are duplicated from the applicant's audit test(s). (4) The number of new or modified tasks meets or exceeds the minimums specified on the form. (5) The number of alternate-path, low-power, emergency, and radiologically controlled area tasks meets the criteria on the form.	PO		
	b. Verify that the administrative outline meets the criteria specified on Form ES-301-1: (1) The tasks are distributed among the topics as specified on the form. (2) At least one task is new or significantly modified. (3) No more than one task is repeated from the last two NRC licensing examinations.	PO		
	c. Determine whether there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on subsequent days.	PO		
4. GENERAL	a. Assess whether plant-specific priorities (including probabilistic risk assessment and individual plant examination insights) are covered in the appropriate exam sections.			
	b. Assess whether the 10 CFR 55.41, 55.43, and 55.45 sampling is appropriate.			
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	N/A at this point in time		
	d. Check for duplication and overlap among exam sections and the last two NRC exams.			
	e. Check the entire exam for balance of coverage.			
	f. Assess whether the exam fits the appropriate job level (RO or SRO).			

		Printed Name/Signature	Date
a.	Author	Pete Ott	3/28/18
b.	Facility Reviewer (*)	N/A for NRC developed outlines	N/A
c.	NRC Chief Examiner (#)	Peter Presby	3/28/18
d.	NRC Supervisor	Donald Jackson	3/29/18

* Not applicable for NRC-prepared examination outlines.

The independent NRC reviewer initials items in column "c"; the chief examiner's concurrence is required.

Facility: GINNA Date of Examination: 2018

Examination Level: RO ☒ SRO ☐ Operating Test Number:

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations K/A - 2.1.6 (3.8) 45.12	D, R	Ability to use procedures related to shift staffing, such a minimum crew complement, overtime limitations, etc. Determine the allowable hours an Operator can work.
Conduct of Operations K/A – 2.1.25 (3.9) 45.12	M, S	Ability to interpret reference materials, such as graphs, curves, tables, etc. Manually Calculate QPTR.
Equipment Control K/A – 2.2.41 (3.5) 45.13	M, R	Ability to obtain and interpret station electrical and mechanical drawings. Determine proper tagging boundary for work.
Radiation Control K/A – 2.3.7 (3.5) 45.10	D, R	Ability to comply with radiation work permit requirements during normal or abnormal conditions. Determine stay time and exit requirements for working in a High Radiation Area.
Emergency Plan		

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

* Type Codes and Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1, randomly selected)

Facility: GINNA Date of Examination: 2018

Examination Level: RO ☐ SRO ☒ Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations K/A - 2.1.6 (4.8) 45.12	D, R	Ability to use procedures related to shift staffing, such a minimum crew complement, overtime limitations, etc. Determine the allowable hours an Operator can work. (Need to modify for SRO level)
Conduct of Operations K/A – 2.1.25 (4.2) 45.12	M, R	Ability to interpret reference materials, such as graphs, curves, tables, etc. Review a manual QPTR calculation.
Equipment Control K/A – 2.2.41 (3.9) 45.13	M, R	Ability to obtain and interpret station electrical and mechanical drawings. Review a clearance and tagging boundary for work.
Radiation Control K/A – 2.3.7 (3.5) 45.10	D R	Ability to comply with radiation work permit requirements during normal or abnormal conditions. Determine stay time and exit requirements for working in a High Radiation Area. (Need to modify for SRO level)
Emergency Plan K/A – 2.4.41 (4.6) 45.11	D, R	Knowledge of the emergency action level thresholds and classification. Classify event, complete notification paperwork, and provide direction to communicator.

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

* Type Codes and Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1, randomly selected)

Facility: Ginna Date of Examination: 8/27/2018

Exam Level: RO ☒ SRO-I ☐ SRO-U ☐ Operating Test Number: _____

Control Room Systems:* 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U

System/JPM Title	Type Code*	Safety Function
a. Borate for one rod not fully inserted following trip per ES-0.1	S, D, A, E	1
b. Remove a Power Range Channel from Service	S, D	7
c. Restore RHR Cooling	S, D, L	4P
d. Respond to a Total Loss of SW	S, D, A, E	4S
e. Transfer to Cold Leg Recirculation	S, D, A, E	2
f. Respond to Controlling Pressurizer Pressure Channel Failing High with stuck open spray valve.	S, M, E, A	3
g. Verify/Initiate Containment Spray Actuation IAW E-0. (Verify NaOH flow)	S, M, E, EN	5
h. Component Cooling Water Leak Isolation	S, N, E	8
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. Align SW to Suction of the TDAFW Pump IAW ER-FIRE.2	D, E	4S
j. Release "D" Gas Decay Tank	R, D, A	9
k. Start "A" EDG Locally per ER-FIRE.1	D	6

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for R /SRO-I/SRO-U
(A)ltemate path	4–6/4–6 /2–3
(C)ontrol room	
(D)irect from bank	≤ 9/≤ 8/≤ 4
(E)mergency or abnormal in-plant	≥ 1/≥ 1/≥ 1
(EN)gineered safety feature	≥ 1/≥ 1/≥ 1 (control room system)
(L)ow-Power/Shutdown	≥ 1/≥ 1/≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2/≥ 2/≥ 1
(P)revious 2 exams	≤ 3/≤ 3/≤ 2 (randomly selected)
(R)CA	≥ 1/≥ 1/≥ 1
(S)imulator	

Facility: Ginna Date of Examination: 8/27/2018

Exam Level: RO ☐ SRO-I ☒ SRO-U ☐ Operating Test Number: _____

Control Room Systems:* 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U

System/JPM Title	Type Code*	Safety Function
a. Borate for one rod not fully inserted following trip per ES-0.1	S, D, A, E	1
b. N/A		
c. Restore RHR Cooling	S, D, L	4P
d. Respond to a Total Loss of SW	S, D, A, E	4S
e. Transfer to Cold Leg Recirculation	S, D, A, E	2
f. Respond to Controlling Pressurizer Pressure Channel Failing High with stuck open spray valve.	S, M, E, A	3
g. Verify/Initiate Containment Spray Actuation IAW E-0. (Verify NaOH flow)	S, M, E, EN	5
h. Component Cooling Water Leak Isolation	S, N, E	8
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. Align SW to Suction of the TDAFW Pump IAW ER-FIRE.2	D, E	4S
j. Release "D" Gas Decay Tank	R, D, A	9
k. Start "A" EDG Locally per ER-FIRE.1	D	6

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for R /SRO-I/SRO-U
(A)lternate path	4–6/4–6 /2–3
(C)ontrol room	
(D)irect from bank	≤ 9/≤ 8/≤ 4
(E)mergency or abnormal in-plant	≥ 1/≥ 1/≥ 1
(EN)gineered safety feature	≥ 1/≥ 1/≥ 1 (control room system)
(L)ow-Power/Shutdown	≥ 1/≥ 1/≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2/≥ 2/≥ 1
(P)revious 2 exams	≤ 3/≤ 3/≤ 2 (randomly selected)
(R)CA	≥ 1/≥ 1/≥ 1
(S)imulator	

ES-301	Control Room/In-Plant Systems Outline	Form ES-301-2

Facility: Ginna — Date of Examination: 8/27/2018

Exam Level: RO ☐ SRO-I ☐ SRO-U ☒ — Operating Test Number: _____

Control Room Systems:* 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U

System/JPM Title	Type Code*	Safety Function
a. N/A		
b. N/A		
c. Restore RHR Cooling	S, D, L	4P
d. N/A		
e. N/A		
f. Respond to Controlling Pressurizer Pressure Channel Failing High with stuck open spray valve.	S, M, E, A	3
g. Verify/Initiate Containment Spray Actuation IAW E-0. (Verify NaOH flow)	S, M, E, EN	5
h. N/A		
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. Align SW to Suction of the TDAFW Pump IAW ER-FIRE.2	D, E	4S
j. Release "D" Gas Decay Tank	R, D, A	9
k. N/A		

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for R /SRO-I/SRO-U
(A)lternate path	4–6/4–6 /2–3
(C)ontrol room	
(D)irect from bank	≤ 9/≤ 8/≤ 4
(E)mergency or abnormal in-plant	≥ 1/≥ 1/≥ 1
(EN)gineered safety feature	≥ 1/≥ 1/≥ 1 (control room system)
(L)ow-Power/Shutdown	≥ 1/≥ 1/≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2/≥ 2/≥ 1
(P)revious 2 exams	≤ 3/≤ 3/≤ 2 (randomly selected)
(R)CA	≥ 1/≥ 1/≥ 1
(S)imulator	

Appendix D	Scenario Outline	Form ES-D-1

Facility: Ginna Scenario No.: 1 Op-Test No.: 2018

Examiners: _____ Operators: _____

Initial Conditions: 1X10^{-8} amps following a forced maintenance outage. The crew will be directed to pull rods to the POAH and start the A MFW Pump in accordance with O-1.2, Plant Startup from Hot Shutdown to Full Power Load.

Turnover: 1C SI Pump C/T for lube oil cooler replacement. (If allowed, expected return in 2 hours – if not, then make a fail to start malfunction)

Critical Tasks: CT #1:E-0 – D: Manually actuate at least one train of Safety Injection before exiting E-0.

CT #2: Manually start at least one RHR pump to provide a low-head injection source prior to initiating SG depressurization in FR-C.2.

CT #3: Depressurize SGs to atmospheric pressure (at < 100°F/hr) to inject ECCS accumulators and establish low-head injection flow before a Core Cooling Red Path develops.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R(ATC) N(CRS, BOP)	Raise power to the POAH
2	A-EDS16	C(BOP) TS (CRS)	Containment Recirculation Fan Cooler A Trips
3	EDS04B	C(ALL) TS (CRS)	Fault / Loss of Emergency Bus: 480V Bus 16
4	RCS02D	M(ALL)	Small Break Loss of Coolant Accident (SBLOCA) (Ramp In)
5	SIS02A SIS02B	C(CRS, ATC)	Failure of AUTO Safety Injection
6	RPS07A	C(CRS, ATC)	1A SI Pump Trip
7	RPS07E	C(BOP)	1A RHR Pump Fails to AUTO Start
8	N/A	(ALL)	FR-C.2 - Degraded Core Cooling

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

Facility: Ginna Scenario No.: 3 Op-Test No.: 2018

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 90% Power

Turnover: Maintaining 90% power following the return of 1A Heater Drain Pump following maintenance, maintenance and engineering monitoring pump seal performance

Critical Tasks: CT #1 - E-3 – A: Isolate feedwater flow into and steam flow from the ruptured SG before a transition to ECA-3.1 occurs.

CT #2 – E-3 – B: Establish/maintain an RCS temperature so that transition from E-3 does not occur because the temperature is either too high to maintain required subcooling or too low causing a challenge to the subcriticality or integrity CSF.

Event No.	Malf. No.	Event Type*	Event Description
1	CVC09	C(ATC)	VCT Divert Control Valve Failure (LCV-112A) – Fails to full divert position, requires taking valve to manual VCT.
2	SGN03B	I(BOP) TS(CRS)	S/G PRESSURE CHANNEL FAILURE : PT-469 (II) – fails low to zero.
3	SGN05B	R(ATC) N(BOP) TS(CRS)	Steam Generator B Tube Leak (SGTL) – 10gpm, downpower required IAW AP-SG.1.
4	EDS01A	C(ALL) TS(CRS)	Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1
5	SGN05B	M(ALL)	B SG SGTR / Rx Trip / SI (Ramp to 750 gpm tube rupture)
6	EDS01B	C(ALL)	Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)
7	PZR05A or PZR05B	C(ATC)	During RCS Depressurization with a PORV, the selected PORV and it's associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED. (Or force the use of PORV 430, by causing PORV 431-C to not open)

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

Facility: Ginna Scenario No.: 4 Op-Test No.: 2018

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 100%

Turnover: The "A" AFW Pump is OOS for Bearing Replacement.

Critical Tasks: CT# 1 – E-0 – Q: Manually trip the turbine before a severe challenge to subcriticality or integrity CSF.

CT #2 – FR-H.1 – A: Establish feedwater to at least one SG before RCS bleed and feed is required.

CT #3 – E-2 – A: Isolate the faulted SG before transition out of E-2.

Event No.	Malf. No.	Event Type*	Event Description
1	PZR03B	I(ATC) TS(CRS)	Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2.E) Defeats failed channel and restores letdown.
2	TUR16A	I(ATC/ BOP)	Turbine 1st Stage Pressure (PI-485) fails low AP-RCC.1, Continuous Control Rod Withdrawal / Insertion. ER-INST.1
3	HTR02A	R(ATC) N(BOP) N(CRS)	HEATER DRAIN TANK PUMP 1A TRIP – AP-FW.1, Abnormal MFW Pump Flow or NPSH. Load reduction to less than 70% IAW AP-TURB.5, Rapid Load Reduction.
4	CND03A	C(BOP)	Hotwell Level Transmitter fails high.
5	STM01A	I(BOP) TS(CRS)	STEAM FLOW CHANNEL FAILURE : FT-464 (1A-1) fails high - ER-INST.1
6	STM02A TUR02	M(ALL)	STMLN BRK OUTSDE CNM UPSTRM MSIV'S:S/G 1A / Turbine fails to Auto Trip
7	RPS07L FDW11A FDW12?	C(ALL)	The "B" AFW Pump will fail to Auto start, then trip after it is manually started. The TDAFW Pump will trip on Overspeed.(Speed Control Failure?)
8	N/A	N/A	FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG "A".

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

Facility: **R.E.Ginna Nuclear Power Plant** Date of Exam: **08/27/2018**

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 and Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A		3	18	3		3		6		
	2	1	2	2				1	2			1	9	3		1		4		
	Tier Totals	4	5	5				4	5			4	27	6		4		10		
2. Plant Systems	1	2	3	3	3	2	2	2	3	2	3	3	28	3		2		5		
	2	1	1	1	1	1	1	1	1	0	1	1	10	2		1		3		
	Tier Totals	3	4	4	4	3	3	3	4	2	4	4	38	5		3		8		
3. Generic Knowledge and Abilities Categories		1		2		3		4					10	1	2	3	4	7		
		2		2		3		3						2	2	1	2			

Note: 1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outline sections (i.e., except for one category in Tier 3 of the SRO-only section, the "Tier Totals" in each K/A category shall not be less than two). (One Tier 3 radiation control K/A is allowed if it is replaced by a K/A from another Tier 3 category.)

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 ±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. Systems/evolutions within each group are identified on the outline. Systems or evolutions that do not apply at the facility should be deleted with justification. 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.

4. 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.

5. 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.

6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.

7. 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.

8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' 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 a category 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.

9. 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.

G* Generic K/As

* These systems/evolutions must be included as part of the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan. They are not required to be included when using earlier revisions of the K/A catalog.

** These systems/evolutions may be eliminated from the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan.

ES-401	PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	Q#
000007 (EPE 7; BW E02&E10; CE E02) Reactor Trip, Stabilization, Recovery / 1	X						EK1.05, Knowledge of the operational implications of the following concepts as they apply to the reactor trip: Decay power as a function of time	3.3	1
000008 (APE 8) Pressurizer Vapor Space Accident / 3					X		**AA2.18, Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: Computer indications for RCS temperature and pressure**	**3.0**	**76**
000009 (EPE 9) Small Break LOCA / 3		X					EK2.03, Knowledge of the interrelations between the small break LOCA and the following: S/Gs	3.0	2
000011 (EPE 11) Large Break LOCA / 3					X		**EA2.09, Ability to determine or interpret the following as they apply to a Large Break LOCA: Existence of adequate natural circulation**	**4.3**	**77**
000015 (APE 15) Reactor Coolant Pump Malfunctions / 4						X	G2.4.47, Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material	4.2	3
000022 (APE 22) Loss of Reactor Coolant Makeup / 2					X		**AA2.04, Ability to determine and interpret the following as they apply to | the Loss of Reactor Coolant Makeup: How long PZR level can be maintained within limits**	**3.8**	**78**
000025 (APE 25) Loss of Residual Heat Removal System / 4					X		AA2.04, Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Location and isolability of leaks	3.3	4
000026 (APE 26) Loss of Component Cooling Water / 8				X			AA1.02, Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water: Loads on the CCWS in the control room	3.2	5
000027 (APE 27) Pressurizer Pressure Control System Malfunction / 3						X	G2.4.30, Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator	2.7	6
000029 (EPE 29) Anticipated Transient Without Scram / 1						X	**G2.1.28, Knowledge of the purpose and function of major system components and controls**	**4.1**	**79**
000038 (EPE 38) Steam Generator Tube Rupture / 3				X			EA1.34, Ability to operate and monitor the following as they apply to a SGTR: Obtaining shutdown with natural circulation	4.2	7
000040 (APE 40; BW E05; CE E05; W E12) Steam Line Rupture—Excessive Heat Transfer / 4						X	**G.2.2.47, Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material**	**4.2**	**80**
000054 (APE 54; CE E06) Loss of Main Feedwater /4	X						AK1.02, Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW): Effects of feedwater introduction on dry S/G	3.6	8
000055 (EPE 55) Station Blackout / 6	X						EK1.02, Knowledge of the operational implications of the following concepts as they apply to the Station Blackout: Natural circulation cooling	4.1	9
000056 (APE 56) Loss of Offsite Power / 6						X	2.4.20, Knowledge of the operational implications of EOP warnings, cautions, and notes	3.8	10

000057 (APE 57) Loss of Vital AC Instrument Bus / 6			X				AK3.01, Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus: Actions contained in EOP for loss of vital ac electrical instrument bus	4.1	11
						X	**G2.2.42, Ability to recognize system parameters that are entry-level conditions for Technical Specifications**	**4.6**	**81**
000058 (APE 58) Loss of DC Power / 6					X		AA2.01, Ability to determine and interpret the following as they apply to the Loss of DC Power: That a loss of dc power has occurred; verification that substitute power sources have come on line	3.7	12
000062 (APE 62) Loss of Nuclear Service Water / 4					X		AA2.03, Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: The valve lineups necessary to restart the SWS while bypassing the portion of the system causing the abnormal condition	2.6	13
000065 (APE 65) Loss of Instrument Air / 8			X				AK3.04, Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Cross-over to backup air supplies	3.0	14
000077 (APE 77) Generator Voltage and Electric Grid Disturbances / 6				X			AA1.01, Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: Grid frequency and voltage	3.6	15
(W E04) LOCA Outside Containment / 3		X					EK2.2, Knowledge of the interrelations between the (LOCA Outside Containment) and the following: 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	3.8	16
(W E11) Loss of Emergency Coolant Recirculation / 4			X				EK3.4, Knowledge of the reasons for the following responses as they apply to the (Loss of Emergency Coolant Recirculation): 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	17
(BW E04; W E05) Inadequate Heat Transfer—Loss of Secondary Heat Sink / 4		X					EK2.2, Knowledge of the interrelations between the (Loss of Secondary Heat Sink) and the following: 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	18
K/A Category Totals:	3	3	3	3	3/**3**	3/**3**	Group Point Total:		18/**6**

ES-401	PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	Q#
000001 (APE 1) Continuous Rod Withdrawal / 1						X	G2.2.37, Ability to determine operability and/or availability of safety related equipment	3.6	19
000003 (APE 3) Dropped Control Rod / 1									
000005 (APE 5) Inoperable/Stuck Control Rod / 1									
000024 (APE 24) Emergency Boration / 1									
000028 (APE 28) Pressurizer (PZR) Level Control Malfunction / 2						**X**	**G2.1.28, Knowledge of the purpose and function of major system components and controls**	**4.1**	**82**
000032 (APE 32) Loss of Source Range Nuclear Instrumentation / 7									
000033 (APE 33) Loss of Intermediate Range Nuclear Instrumentation / 7									
000036 (APE 36; BW/A08) Fuel-Handling Incidents / 8					X		AA2.03, Ability to determine and interpret the following as they apply to the Fuel Handling Incidents: Magnitude of potential radioactive release	3.1	20
000037 (APE 37) Steam Generator Tube Leak / 3	X						AK1.02, Knowledge of the operational implications of the following concepts as they apply to Steam Generator Tube Leak: Leak rate vs. pressure drop	3.5	21
000051 (APE 51) Loss of Condenser Vacuum / 4				X			AA1.04, Ability to operate and / or monitor the following as they apply to the Loss of Condenser Vacuum: Rod position	2.5	22
000059 (APE 59) Accidental Liquid Radwaste Release / 9					**X**		**AA2.05, Ability to determine and interpret the following as they apply to the Accidental Liquid Radwaste Release: The occurrence of automatic safety actions as a result of a high PRM system signal**	**3.9**	**83**
000060 (APE 60) Accidental Gaseous Radwaste Release / 9									
000061 (APE 61) Area Radiation Monitoring System Alarms / 7					**X**		**AA2.06, Ability to determine and interpret the following as they apply to the Area Radiation Monitoring (ARM) System Alarms: Required actions if alarm channel is out of service**	**4.1**	**84**
000067 (APE 67) Plant Fire On Site / 8					**X**		**AA2.05, Ability to determine and interpret the following as they apply to the Plant Fire on Site: Ventilation alignment necessary to secure affected area**	**4.2**	**85**
000068 (APE 68; BW A06) Control Room Evacuation / 8		X					AK2.03, Knowledge of the interrelations between the Control Room Evacuation and the following: Controllers and positioners	2.9	23
000069 (APE 69; W E14) Loss of Containment Integrity / 5									
000074 (EPE 74; W E06 & E07) Inadequate Core Cooling / 4			X				EK3.05, Knowledge of the reasons for the following responses as they apply to the Inadequate Core Cooling: Activating the HPI system	4.4	24

000076 (APE 76) High Reactor Coolant Activity / 9									
000078 (APE 78*) RCS Leak / 3							Not applicable to Rev 2 K/As.		
(W E01 & E02) Rediagnosis & SI Termination / 3									
(W E13) Steam Generator Overpressure / 4									
(W E15) Containment Flooding / 5			X				EK3.2, Knowledge of the reasons for the following responses as they apply to the (Containment Flooding): Normal, abnormal and emergency operating procedures associated with (Containment Flooding).	2.8	25
(W E16) High Containment Radiation /9									
(BW A01) Plant Runback / 1							Not applicable to plant design.		
(BW A02 & A03) Loss of NNI-X/Y/7							Not applicable to plant design.		
(BW A04) Turbine Trip / 4							Not applicable to plant design.		
(BW A05) Emergency Diesel Actuation / 6							Not applicable to plant design.		
(BW A07) Flooding / 8							Not applicable to plant design.		
(BW E03) Inadequate Subcooling Margin / 4							Not applicable to plant design.		
(BW E08; W E03) LOCA Cooldown—Depressurization / 4		X					EK2.2, Knowledge of the interrelations between the (LOCA Cooldown and Depressurization) and the following: 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.	3.7	26
(BW E09; CE A13**; W E09 & E10) Natural Circulation/4									
(BW E13 & E14) EOP Rules and Enclosures							Not applicable to plant design.		
(CE A11**; W E08) RCS Overcooling—Pressurized Thermal Shock / 4					X		EA2.2, Ability to determine and interpret the following as they apply to the (Pressurized Thermal Shock): Adherence to appropriate procedures and operation within the limitations in the facility*s license and amendments	3.5	27
(CE A16) Excess RCS Leakage / 2							Not applicable to plant design.		
(CE E09) Functional Recovery							Not applicable to plant design.		
(CE E13*) Loss of Forced Circulation/LOOP/Blackout / 4							Not applicable to Rev 2 K/As.		
K/A Category Point Totals:	1	2	2	1	**2/3**	**1/1**	Group Point Total:		**9/4**

ES-401	PWR Examination Outline Plant Systems—Tier 2/Group 1 (RO/SRO)											Form ES-401-2		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	Q#
003 (SF4P RCP) Reactor Coolant Pump									X			A3.01, Ability to monitor automatic operation of the RCPS, including: Seal injection flow	3.3	28
004 (SF1; SF2 CVCS) Chemical and Volume Control				X								K4.08, Knowledge of CVCS design feature(s) and/or interlock(s) which provide for the following: Hydrogen control in RCS	2.8	29
									X			A3.02, Ability to monitor automatic operation of the CVCS, including: Letdown isolation	3.6	30
005 (SF4P RHR) Residual Heat Removal						X						K6.03, Knowledge of the effect of a loss or malfunction on the following will have on the RHRS: RHR heat exchanger	2.5	31
006 (SF2; SF3 ECCS) Emergency Core Cooling							X					A1.14, Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including:	3.6	32
								X				**A2.06, Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:**	**3.1**	**86**
007 (SF5 PRTS) Pressurizer Relief/Quench Tank					X							K5.02, Knowledge of the operational implications of the following concepts as the apply to PRTS: Method of forming a steam bubble in the PZR	3.1	33
							X					A1.02, Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: Maintaining quench tank pressure	2.7	34
008 (SF8 CCW) Component Cooling Water				X								K4.01, Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: Automatic start of standby pump	3.1	35
010 (SF3 PZR PCS) Pressurizer Pressure Control						X						K6.04, Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: PRT	2.9	36
											X	G2.2.38, Knowledge of conditions and limitations in the facility license.	3.6	37
012 (SF7 RPS) Reactor Protection										X		A4.01, Ability to manually operate and/or monitor in the control room: Manual trip button	4.5	38
								X				**A2.03, 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: Incorrect channel bypassing**	**3.7**	**87**
013 (SF2 ESFAS) Engineered Safety Features Actuation					X							K5.02, Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Safety system logic and reliability	2.9	39

022 (SF5 CCS) Containment Cooling									X		A4.01, Ability to manually operate and/or monitor in the control room: CCS fans	3.6	40
							X				**A2.04, Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of service water**	**3.2**	**88**
025 (SF5 ICE) Ice Condenser											Not applicable to plant design.		
026 (SF5 CSS) Containment Spray			X								K3.02, Knowledge of the effect that a loss or malfunction of the CSS will have on the following: Recirculation spray system	4.2	41
							X				A2.08, Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Safe securing of containment spray when it can be done)	3.2	42
039 (SF4S MSS) Main and Reheat Steam									X		A4.04, Ability to manually operate and/or monitor in the control room: Emergency feedwater pump turbines	3.8	43
										X	G2.4.45, Ability to prioritize and interpret the significance of each annunciator or alarm	4.1	44
059 (SF4S MFW) Main Feedwater				X							K4.08, Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Feedwater regulatory valve operation (on basis of steam flow, feed flow mismatch)	2.5	45
										X	**G2.4.35, Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects**	**4.0**	**89**
061 (SF4S AFW) Auxiliary/Emergency Feedwater		X									K2.02, Knowledge of bus power supplies to the following: AFW electric drive pumps	3.7	46
			X								K3.02, Knowledge of the effect that a loss or malfunction of the AFW will have on the following: S/G	4.2	47
062 (SF6 ED AC) AC Electrical Distribution		X									K2.01, Knowledge of bus power supplies to the following: Major system loads	3.3	48
063 (SF6 ED DC) DC Electrical Distribution		X									K2.01, Knowledge of bus power supplies to the following: Major DC loads	2.9	49
							X				A2.01, Ability to (a) predict the impacts of the following malfunctions or operations on the DC electrical systems; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Grounds	2.5	50

064 (SF6 EDG) Emergency Diesel Generator							X				A2.02, Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Load, VARS, pressure on air compressor, speed droop, frequency, voltage, fuel oil level, temperatures	2.7	51
										X	**G2.2.38, Knowledge of conditions and limitations in the facility license**	**4.5**	**90**
073 (SF7 PRM) Process Radiation Monitoring										X	G.2.1.20, Ability to interpret and execute procedure steps	4.6	52
076 (SF4S SW) Service Water	X										K1.19, Knowledge of the physical connections and/or cause- effect relationships between the SWS and the following systems: SWS emergency heat loads	3.6	53
078 (SF8 IAS) Instrument Air			X								K3.02, Knowledge of the effect that a loss or malfunction of the IAS will have on the following: Systems having pneumatic valves and controls	3.4	54
103 (SF5 CNT) Containment	X										K1.08, Knowledge of the physical connections and/or cause-effect relationships between the containment system and the following systems: SIS, including action of safety injection reset	3.6	55
053 (SF1; SF4P ICS*) Integrated Control											Not applicable to Rev 2 K/As.		
K/A Category Point Totals:	2	3	3	3	2	2	2	3/ **3**	2	3	3/ **2**	Group Point Total:	28/**5**

ES-401	PWR Examination Outline Plant Systems—Tier 2/Group 2 (RO/SRO)											Form ES-401-2	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	Q#
001 (SF1 CRDS) Control Rod Drive			X									K3.01, Knowledge of the effect that a loss or malfunction of the CRDS will have on the following: CVCS	2.9	56
002 (SF2; SF4P RCS) Reactor Coolant														
011 (SF2 PZR LCS) Pressurizer Level Control														
014 (SF1 RPI) Rod Position Indication								**X**				**A2.04, Ability to (a) predict the impacts of the following malfunctions or operations on the RPIS; and (b) based on those on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Misaligned rod**	**3.9**	**91**
015 (SF7 NI) Nuclear Instrumentation											X	G2.2.42, Ability to recognize system parameters that are entry-level conditions for Technical Specifications	3.9	57

016 (SF7 NNI) Nonnuclear Instrumentation	X										K1.06, Knowledge of the physical connections and/or cause-effect relationships between the NNIS and the following systems: AFW system	3.6	58
017 (SF7 ITM) In-Core Temperature Monitor													
027 (SF5 CIRS) Containment Iodine Removal													
028 (SF5 HRPS) Hydrogen Recombiner and Purge Control								X			A2.01, Malfunctions or operations on the HRPS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Hydrogen recombiner power setting, determined by using plant data book	3.4	59
029 (SF8 CPS) Containment Purge													
033 (SF8 SFPCS) Spent Fuel Pool Cooling													
034 (SF8 FHS) Fuel-Handling Equipment						X					K6.02, Knowledge of the effect of a loss or malfunction on the following will have on the Fuel Handling System : Radiation monitoring systems	2.6	60
035 (SF 4P SG) Steam Generator								**X**			**A2.01 Ability to (a) predict the impacts of the following malfunctions or operations on the GS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Faulted or ruptured S/Gs**	**4.6**	**92**
041 (SF4S SDS) Steam Dump/Turbine Bypass Control				X							K4.11, Knowledge of SDS design feature(s) and/or interlock(s) which provide for the following: T-ave/T-ref program	2.8	61
045 (SF 4S MTG) Main Turbine Generator													
055 (SF4S CARS) Condenser Air Removal										**X**	**G2.4.34, Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects**	**4.1**	**93**
056 (SF4S CDS) Condensate													
068 (SF9 LRS) Liquid Radwaste													
071 (SF9 WGS) Waste Gas Disposal							X				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	62
072 (SF7 ARM) Area Radiation Monitoring					X						K5.02, Knowledge of the operational implications of the following concepts as they apply to the ARM system: Radiation intensity changes with source distance	2.5	63
075 (SF8 CW) Circulating Water		X									K2.03, Knowledge of bus power supplies to the following: Emergency/essential SWS pumps	2.6	64
079 (SF8 SAS**) Station Air													
086 Fire Protection										X	A4.06, Ability to manually operate and/or monitor in the control room: Halon system	3.2	65
050 (SF 9 CRV*) Control Room Ventilation											Not applicable to Rev. 2 K/As.		
K/A Category Point Totals:	1	1	1	1	1	1	1	1/**2**	0	1	1/**1**	Group Point Total:	10/**3**

Facility: **R.E.Ginna Nuclear Power Plant** Date of Exam: **08/27/2018**						
Category	K/A #	Topic	RO		SRO-only	
			IR	Q#	IR	Q#
	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation	4.4	66		
	2.1.30	**Ability to locate and operate components, including local controls**			**4.0**	**94**
	2.1.36	Knowledge of procedures and limitations involved in core alterations	3.0	67		
	2.1.45	**Knowledge of new and spent fuel movement procedures**			**4.3**	**95**
2. Equipment Control	2.2.13	Knowledge of tagging and clearance procedures	4.1	68		
	2.2.18	**Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.**			**3.9**	**96**
	2.2.38	**Knowledge of conditions and limitations in the facility license**			**4.5**	**97**
	2.2.43	Knowledge of the process used to track inoperable alarms	3.0	69		
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	70		
	2.3.6	**Ability to approve release permits**			**3.8**	**98**
	2.3.12	Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.2	71		
	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	72		
4. Emergency Procedures/Plan	2.4.11	Knowledge of abnormal condition procedures	4.0	73		
	2.4.18	**Knowledge of the specific bases for EOPs**			**4.0**	**99**
	2.4.25	Knowledge of fire protection procedures	3.3	74		
	2.4.31	Knowledge of annunciator alarms, indications, or response procedures	4.2	75		
	2.4.40	**Knowledge of SRO responsibilities in emergency plan implementation**			**4.5**	**100**
Tier 3 Point Total				10		**7**