Facility: Ginna		Date of Examination:	3/2017
Examination Level:	RO	Operating Test Number:	N17-1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed	
Conduct of Operations	D, P, R	2.1.43 (4.1)	Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.
		JPM:	Perform a Post-Trip Xenon Reactivity Calculation
Conduct of Operations	M, R	2.1.37 (4.3)	Knowledge of procedures, guidelines, or limitations associated with reactivity management
		JPM:	Verify SDM for a Shutdown Reactor with Untrippable Rods
Equipment Control	N, R	2.2.43 (3.0)	Knowledge of the process used to track inoperable alarms
		JPM:	Remove Annunciators From Service
Radiation Control	N, R	2.3.7 (3.5)	Ability to comply with radiation work permit requirements during normal or abnormal conditions
		JPM:	Evaluate Stay Time with lowered Spent Fuel Pool Level

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.

*Type Codes & Criteria:

(C)ontrol room, **(0)** (S)imulator, **(0)** or Class(R)oom **(4)**
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) **(1)**
(N)ew or (M)odified from bank (≥ 1) **(3)**
(P)revious 2 exams (≤ 1; randomly selected) **(1)**

RO Admin JPM Summary

A1a This is a Bank JPM. The operator will be told that the plant has tripped from 50% power, that the reactor had been operating at this power for the last 3 days prior to the trip, that the XENON PREDICT program on the PPCS is NOT available, and that it is currently 0900 on 3/3/17. The operator will be provided with O-3, Hot Shutdown With Xenon P{resent with its Prerequisites completed, and directed to perform a Xenon Reactivity Calculation in accordance with Steps 6.1.1 through 6.1.2 of O-3. The operator will be expected to determine that it will take 13.5 hours for Xenon to decay to the value at the time of shutdown, and that this will occur at 2100 on 3/3/17. This JPM was on the N14-1 NRC Exam (One of Previous two NRC Exams).

A1b This is a Modified JPM. The operator will be told that the plant is stable in MODE 3 following an inadvertent reactor trip from 100% power, and provided with a set of plant conditions. The operator will be directed to verify SDM per O-3.1, Boron Concentration for the Xenon Free All Rods in – Most Reactive Rod Stuck Out Shutdown Margin, to the point at which Independent Verification is required. The operator will be expected to complete Sections 6.1, 6.2, 6.3 and 6.4 in accordance with the provided KEY, and determine that further RCS boration is required to ensure SDM.

A2 This is a New JPM. The operator will be told that the plant is operating at 100% power, that and the CRS has determined that three MCB Annunciators must be placed out-of-service for various reasons. The operator will be provided with an overlay of the applicable MCB Annunciator Panel, and a supply of flagging tools (colored dots), and directed to place the annunciators out-of-service, completing all required paperwork. The operator will be expected to place the correct colored dot on the MCB Annunciator Overlay, and complete Attachment 1, Alarm Annunciator Out-Of-Service Log, of OPG-ANNUNCIATOR-FLAGGING, in accordance with the attached KEY.

A3 This is a New JPM. The operator will be told that a station wide accident has occurred due to an Earthquake, that the plant is in Mode 6 with a full core off-load, and that the Spent Fuel Pool level has lowered to 10 feet above the top of the fuel, and has stabilized at this level. The operator will also be told that the crew is implementing ER-SFP.2, Diverse SFP Makeup and Spray, provided with radiological conditions and a dose limit, and told that they have been assigned a repetitive task which will require them to enter the Spent Fuel Building and proceed to the area around the Spent Fuel Pool, and remain there for 3 minutes, before exiting the building. The operator will be directed to estimate how many times you can perform this repetitive task before you must be replaced by another operator. The operator will be expected to determine that the repetitive task can be performed 6 times before another operator will need to perform the task.

Facility:	Ginna	Date of Examination:	3/2017
Exam Level:	RO	Operating Test No.:	N17-1

Control Room Systems@ (8 for RO)

System / JPM Title	Type Code*	Safety Function
A. EPE E14 High Containment Pressure [EPE E14 EA1.1 (3.7/3.7)] Verify Containment Isolation and Heat Removal	S, P, D, A, EN	5
B. 003 Reactor Coolant Pump System [003 A4.01 (3.3/3.2)] Start an RCP during Plant Startup	S, D, A, L	4P
C. 059 Main Feedwater System [059 A2.12 (3.1/3.4)] Placing Main FRV in Auto when Bypass FRV is Controlling S/G Level in Auto	S, N, A	4S
D. APE 003 Dropped Control Rod [APE 003 AA1.02 (3.6/3.4)] Dropped Rod Recovery w/Second Dropped Rod	S, M, A	1
E. 062 A. C. Electrical Distribution [062 A4.01 (3.3/3.1)] Establish 100/0 Electric Lineup on Circuit 767	S, P, D, A	6
F. 006 Emergency Core Cooling System [006 A4.02 (4.0/3.8)] Add Nitrogen to an SI Accumulator	S, D, EN	3
G. 029 Containment Purge System [029 A2.01 (2.9/3.6)] Startup the Containment Mini-Purge	S, D	8
H. 012 Reactor Protection System [012 A4.04 (3.3/3.3)] Defeat a Failed S/G Pressure Channel	S, D	7

In-Plant Systems@ (3 for RO)

System / JPM Title	Type Code*	Safety Function
I. APE 056 Loss of Off-Site Power [APE 056 AA1.03 (3.2/3.3)] Energize a Minimum of 100 KW B/U Heaters onto EDG	P, D, R, E	6
J. APE 067 Plant Fire On Site [APE 067 AA2.16 (3.3/4.0)] Take Local Manual Control of a Charging Pump	D, R, E	8
K. EPE 029 Anticipated Transient Without Scram (ATWS) [EPE 029 EA1.11 (3.9/4.1)] Locally Open the Rx Trip Breakers	D, E	1

@ 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	4-6 (5)
(C)ontrol room	
(D)irect from bank	≤ 9 (9)
(E)mergency or abnormal in-plant	≥ 1 (3)
(EN)gineered Safety Feature	≥ 1 (2) (Control Room System)
(L)ow-Power / Shutdown	≥ 1 (1)
(N)ew or (M)odified from bank including 1(A)	≥ 2 (2)
(P)revious 2 exams	≤ 3 (3) (Randomly Selected)
(R)CA	≥ 1 (2)
(S)imulator	

JPM Summary

JPM A This is a Bank JPM. The operator will be told that the plant tripped from 100% power and safety injection has actuated, that the crew entered E-0, Reactor Trip or Safety Injection, and then transitioned to E-2, Faulted Steam Generator Isolation, and that due to a degrading transient, an Orange Path now exists on the Containment Critical Safety Function Status Tree. The operator will be directed to verify Containment Isolation and Heat Removal systems are operating as expected by performing FR-Z.1, Response to High Containment Pressure, starting from Step 1. During the course of this action, the operator will recognize that two Containment Isolation Valves have failed to automatically close, and that the Containment Spray ESFAS Signal has failed to function. The operator will be expected to take action to verify Containment Isolation and Heat Removal systems are operating in accordance with Steps 1-3 of FR-Z.1. When the operator discovers that two Containment Isolation Valves have failed to close as expected the operator will close or direct that alternative valves be closed in accordance with ATT-3.0, Attachment CI/CVI. When it is revealed that one of the two actions on ATT-3.0 were unsuccessful at providing Containment Isolation **(Alternate Path)**, the operator will need to take actions to trip the Reactor Coolant Pumps, and close an alternate valve in the CCW System to fully achieve Containment Isolation. This JPM was on the N14-1 NRC Exam (One of Previous two NRC Exams).

JPM B This is a Bank JPM. The operator will be told that the plant is returning to service from a refueling outage, that the B RCP is running and that it is desired to start the A RCP. The operator will be directed to start the A RCP in accordance with O-1.1, Plant Heatup From Cold Shutdown to Hot Shutdown. Subsequent to the pump start an oil leak will develop on the pump motor **(Alternate Path).** The operator will be expected start the "A" RCP per O-1.1 and S-2.1, and then diagnose a low oil level in the pump, and stop the pump per plant Annunciator Response Procedures.

JPM C This is a New JPM. The operator will be told that the "A" Main Feed Regulating Bypass Valve is operating in AUTO to allow I&C to complete corrective maintenance on the A FRV Controller, and that the maintenance is now complete. The operator will be directed to Place the A FRV back in AUTO and to close the A FRV Bypass Valve IAW Attachment 2, CROI-1 Placing Bypass FRV in Auto and Main FRV in Manual, of P-17, Operations Control Room Operating Instructions. While closing the Bypass Valve the A FRV will fail to control in AUTO **(Alternate Path)**, and the operator will need to take manual control of the A FRV to control S/G level.

JPM D This is a Modified JPM. The operator will be told that reactor power is stable at < 50%, that a Control Rod dropped into the reactor core 55 minutes ago, that AP-RCC.3, Dropped Rod Recovery, has been carried out, and that the crew is currently in ER-RCC.1, Retrieval of a Dropped Rod, and has completed this procedure through Step 6.2.3. The operator will be directed to recover the dropped rod in accordance with ER-RCC.1, starting with Step 6.2.4. During the course of the procedure implementation the operator will discover that a second control rod drops into the core **(Alternate Path)**. The operator will be expected to attempt to recover the Control Rod per ER-RCC.1; and then manually trip the reactor during the recovery when it is diagnosed that two dropped rods exist.

JPM E This is a Bank JPM. The operator will be told that the plant is operating at 100% power, that the Electric Plant is currently in a 50/50 NORMAL lineup, and that RG&E ECC has requested that the plant be placed in a 100/0 lineup on Circuit 767 for scheduled maintenance on offsite Circuit 7T later today. The operator will be directed to establish a 100/0 Electric Plant alignment per Section 6.3 of O-6.9.2, Establishing and/or Transferring Offsite Power to Bus 12A/Bus 12B. The operator will be expected to Transfer 4160V buses from a 50/50 NORMAL Lineup to 100/0 Lineup on Circuit 767, recognize a failure of breaker 52/12AY to auto trip **(Alternate Path)**, and implement Attachment 1, 7T/Bus 12A Circulating Current Contingency Action, of O-6.9.2 to realign the electric plant to a 50/50 lineup. This JPM was on the N12-1R NRC Exam (One of Previous two NRC Exams).

JPM F This is a Bank JPM. The operator will be told that the plant is operating at 100% power, and that MCB Annunciator C-11, ACCUMULATOR 1A (LOOP B) PRESS 730 PSI 760, has alarmed. The operator will be directed to coordinate with the Equipment Operator and raise the pressure in the A Accumulator to 745 ±10 psig per S-16.2, Nitrogen Makeup to the SI Accumulators, using nitrogen cluster A. The operator will be expected to raise the A SI Accumulator pressure to 745±10 psig per S-16.2.

JPM G This is a Bank JPM. The operator will be told that the plant is operating at 100% power. That a Containment entry for maintenance is scheduled, that a Containment Mini-Purge Release has been approved, and that the Prerequisites of S-23.2.3, Containment Mini-Purge System Operation have been established for startup of the Containment Mini-Purge System. The operator will be directed to startup the Containment Mini-Purge System per S-23.2.3. The operator will be expected to start the Containment Mini-Purge System per S-23.2.3.

JPM H This is a Bank JPM. The operator will be told that the plant was operating at 100% power when PI-468 failed low, that appropriate actions were taken to stabilize the plant, and that the brief for defeating the associated channel has been completed. The operator will be directed to defeat affected Steam Generator pressure channel as per Attachment 30, Red Channel – S/G Pressure Channel PI-468, of ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure. The operator will be expected to defeat S/G Pressure Channel PI-468 using Attachment 30 of ER-INST.1.

JPM I This is a Bank JPM. The operator will be told that plant was operating at 100% power when it experienced an SI coincident with a loss of all AC power, that the B EDG is now running and carrying approximately 1650 KW on Buses 16 and 17, that PRZR level is 20% and stable, that CNMT pressure is 0.4 psig and that SI has been RESET. The operator will be directed to energize a minimum 100 KW of PRZR BACKUP heaters per ER-PRZR.1, Restoration of PRZR Heaters During Blackout. The operator will be expected to energize a minimum of 100KW of PRZR Heaters in accordance with ER-PRZR.1. This JPM was on the N12-1R NRC Exam (One of Previous two NRC Exams).

JPM J This is a Bank JPM. The operator will be told that a fire in the Cable Tunnel is on-going, forcing the crew to implement ER-FIRE.2, Alternate Shutdown For Cable Tunnel Fire. The operator will be directed to The CRS has directed you to start and control the A Charging Pump in accordance with procedure ER-FIRE.2, Attachment 4, Section 8.0, until charging flow is verified to the RCS. The operator will be expected to start, control and initiate charging flow locally from the A Charging Pump per Attachment 4 of ER-FIRE.2.

JPM K This is a Bank JPM. The operator will be told that the plant has experienced a reactor trip signal and the crew entered procedure E-0, Reactor Trip or Safety Injection; and that the reactor trip could not be verified, and the crew entered FR-S.1, Response to Reactor Restart/ATWS. The operator will be directed to locally depress the trip pushbutton for BOTH Control Rod Drive Motor Generator Set Breakers at the CRDM Control Panel per the Step 1 RNO of FR-S.1. When the operator attempts to open the 52-2/MG1B Breaker, it will be discovered that this breaker will not trip; and the US will direct that the operator trip both of the Rx Trip Breakers locally. The operator will be expected to attempt to trip the Control Rod Drive Motor Generator Set Breaker(s); and when it is discovered that the 52-2/MG1B will not trip, manually trip both Rx Trip Breakers when directed.

Facility: Ginna		Date of Examination:	3/2017
Examination Level:	SRO	Operating Test Number:	N17-1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed	
Conduct of Operations	D, P, R	2.1.25 (4.2)	Ability to interpret reference materials, such as graphs, curves, tables, etc.
		JPM:	Determine Time to Boil for a Loss of Shutdown Cooling
Conduct of Operations	M, R	2.1.20 (4.6)	Ability to interpret and execute procedure steps
		JPM:	Verify Required Service Water to Emergency Diesel Generators
Equipment Control	D, R	2.2.37 (4.6)	Ability to determine operability and/or availability of safety related equipment
		JPM:	Perform a Safety Function Determination
Radiation Control	N, R	2.3.7 (3.6)	Ability to comply with radiation work permit requirements during normal or abnormal conditions
		JPM:	Evaluate Stay Time with lowered Spent Fuel Pool Level
Emergency Plan	M, R	2.4.44 (4.4)	Knowledge of emergency plan protective action recommendations
		JPM:	Protective Action Recommendations

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.

*Type Codes & Criteria:

(C)ontrol room, **(0)** (S)imulator, **(0)** or Class(R)oom **(5)**
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) **(2)**
(N)ew or (M)odified from bank (≥ 1) **(3)**
(P)revious 2 exams (≤ 1; randomly selected) **(1)**

SRO Admin JPM Summary

A1a This is a Bank JPM. The operator will be provided with two sets of shutdown conditions; one current, and one projected to exist within four days. The operator will be directed to determine the Time to Boil given a Loss of RHR for each of the two sets of conditions. The operator will be expected to use IP-OUT-2, Outage Risk Management, and determine that the Time to Boil for the present plant conditions is 2.46 hours, and for the projected conditions four days from now is .43 hours (25.96 +0.1/-0.0 minutes). This JPM was on the N14-1 NRC Exam (One of Previous two NRC Exams).

A1b This is a modified Bank JPM. The operator will be told that the plant is operating at 100% power, provided with the plant configuration which includes both Emergency Diesel Generators running while operating with AP-ELEC.2, Safeguard Busses Low Voltage or System Abnormal Frequency, and a set of Service Water ΔP's readings from the A and B Emergency Diesel Generator (EDG) Lube Oil Coolers and Jacket Water Heat Exchangers. The operator will be directed to verify that the EDG Service Water Differential Pressures (ΔPs) are within required limits by performing Step 6.4.3 of O-6.13, Daily Surveillance Log, and identify all, if any, required action. The operator will be expected to identify that all Service Water flows to the Emergency Diesel Generators are within limits, determine that both EDGs are OPERABLE, and identify that an Issue Report requesting a PRI 2 Work Order for both the A and B EDGs to flush both coolers must be initiated.

A2 This is a Bank JPM. The operator will be told that the plant is operating at 100% power, given a specific time and date, and the status of several Important To Safety components that are out of service. The operator will be directed to fill out an A-52.4, Attachment 1, Control Of Limiting Conditions for Operating Equipment through step 3.0, and Attachment 2, Loss of Safety Function, for the given plant conditions. The operator will be expected to complete Sections 1.0, 2.0 and 3.0 of Attachment 1 and all of Attachment 2 of A-52.4 in accordance with the provided KEY.

A3 This is a New JPM. The operator will be told that a station wide accident has occurred due to an Earthquake, that the plant is in Mode 6 with a full core off-load, and that the Spent Fuel Pool level has lowered to 10 feet above the top of the fuel, and has stabilized at this level. The operator will also be told that the crew is implementing ER-SFP.2, Diverse SFP Makeup and Spray, provided with radiological conditions and a dose limit, and told that an operator has been assigned a repetitive task which will require them to enter the Spent Fuel Building and proceed to the area around the Spent Fuel Pool, and remain there for 3 minutes, before exiting the building. The operator will be directed to estimate how many times the assigned operator can perform this repetitive task before you must be replaced by another operator; and to evaluate what this individual will need to enter the Spent Fuel Building in order to comply with Technical Specification and/or ODCM limits, without being accompanied by RP Personnel. The operator will be expected to determine that the repetitive task can be performed 6 times before another operator will need to perform the task; and identify that the operator entering the SFP must have a radiation monitoring device that continuously indicates the radiation dose rate in the area, and/or radiation monitoring device that continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received.

A4 This is a modified Bank JPM. The operator will be provided with a set of initial conditions that have resulted in a projection that RCS level will not be monitored for > 30 minutes, with core uncovery as indicated by unexplained level rise in Containment Sump B, AND Containment closure is not established, and be told that a General Emergency based on EAL CG3.1 was declared. The operator will be directed to determine the Protective Action Recommendation and complete the GNP NY State Radiological Emergency Data Form (Part 1) (CNG) boxes 6-12. The operator will determine that ERPAs W-1, W-Lake, and M-Lake must be evacuated; and complete the GNP NY State Radiological Emergency Data Form (Part 1) (CNG) in accordance with the attached KEY.

Facility:	Ginna	Date of Examination:	3/2017
Exam Level:	SROI	Operating Test No.:	N17-1

Control Room Systems@ (7 for SRO-I)

System / JPM Title	Type Code*	Safety Function
A. EPE E14 High Containment Pressure [EPE E14 EA1.1 (3.7/3.7)] Verify Containment Isolation and Heat Removal	S, P, D, A, EN	5
B. 003 Reactor Coolant Pump System [003 A4.01 (3.3/3.2)] Start an RCP during Plant Startup	S, D, A, L	4P
C. 059 Main Feedwater System [059 A2.12 (3.1/3.4)] Placing Main FRV in Auto when Bypass FRV is Controlling S/G Level in Auto	S, N, A	4S
D. APE 003 Dropped Control Rod [APE 003 AA1.02 (3.6/3.4)] Dropped Rod Recovery w/Second Dropped Rod	S, M, A	1
E. 062 A. C. Electrical Distribution [062 A4.01 (3.3/3.1)] Establish 100/0 Electric Lineup on Circuit 767	S, P, D, A	6
F. 006 Emergency Core Cooling System [006 A4.02 (4.0/3.8)] Add Nitrogen to an SI Accumulator	S, D, EN	3
G. 029 Containment Purge System [029 A2.01 (2.9/3.6)] Startup the Containment Mini-Purge	S, D	8
H. NA		

In-Plant Systems@ (3 for SRO-I)

System / JPM Title	Type Code*	Safety Function
I. APE 056 Loss of Off-Site Power [APE 056 AA1.03 (3.2/3.3)] Energize a Minimum of 100 KW B/U Heaters onto EDG	P, D, R, E	6
J. APE 067 Plant Fire On Site [APE 067 AA2.16 (3.3/4.0)] Take Local Manual Control of a Charging Pump	D, R, E	8
K. EPE 029 Anticipated Transient Without Scram (ATWS) [EPE 029 EA1.11 (3.9/4.1)] Locally Open the Rx Trip Breakers	D, E	1

@ 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 SRO-I
(A)lternate path	4-6 (5)
(C)ontrol room	
(D)irect from bank	≤ 8 (8)
(E)mergency or abnormal in-plant	≥ 1 (3)
(EN)gineered Safety Feature	≥ 1 (2) (Control Room System)
(L)ow-Power / Shutdown	≥ 1 (1)
(N)ew or (M)odified from bank including 1(A)	≥ 2 (2)
(P)revious 2 exams	≤ 3 (3) (Randomly Selected)
(R)CA	≥ 1 (2)
(S)imulator	

JPM Summary

JPM A This is a Bank JPM. The operator will be told that the plant tripped from 100% power and safety injection has actuated, that the crew entered E-0, Reactor Trip or Safety Injection, and then transitioned to E-2, Faulted Steam Generator Isolation, and that due to a degrading transient, an Orange Path now exists on the Containment Critical Safety Function Status Tree. The operator will be directed to verify Containment Isolation and Heat Removal systems are operating as expected by performing FR-Z.1, Response to High Containment Pressure, starting from Step 1. During the course of this action, the operator will recognize that two Containment Isolation Valves have failed to automatically close, and that the Containment Spray ESFAS Signal has failed to function. The operator will be expected to take action to verify Containment Isolation and Heat Removal systems are operating in accordance with Steps 1-3 of FR-Z.1. When the operator discovers that two Containment Isolation Valves have failed to close as expected the operator will close or direct that alternative valves be closed in accordance with ATT-3.0, Attachment CI/CVI. When it is revealed that one of the two actions on ATT-3.0 were unsuccessful at providing Containment Isolation **(Alternate Path)**, the operator will need to take actions to trip the Reactor Coolant Pumps, and close an alternate valve in the CCW System to fully achieve Containment Isolation. This JPM was on the N14-1 NRC Exam (One of Previous two NRC Exams).

JPM B This is a Bank JPM. The operator will be told that the plant is returning to service from a refueling outage, that the B RCP is running and that it is desired to start the A RCP. The operator will be directed to start the A RCP in accordance with O-1.1, Plant Heatup From Cold Shutdown to Hot Shutdown. Subsequent to the pump start an oil leak will develop on the pump motor **(Alternate Path).** The operator will be expected start the "A" RCP per O-1.1 and S-2.1, and then diagnose a low oil level in the pump, and stop the pump per plant Annunciator Response Procedures.

JPM C This is a New JPM. The operator will be told that the "A" Main Feed Regulating Bypass Valve is operating in AUTO to allow I&C to complete corrective maintenance on the A FRV Controller, and that the maintenance is now complete. The operator will be directed to Place the A FRV back in AUTO and to close the A FRV Bypass Valve IAW Attachment 2, CROI-1 Placing Bypass FRV in Auto and Main FRV in Manual, of P-17, Operations Control Room Operating Instructions. While closing the Bypass Valve the A FRV will fail to control in AUTO **(Alternate Path)**, and the operator will need to take manual control of the A FRV to control S/G level.

JPM D This is a Modified JPM. The operator will be told that reactor power is stable at < 50%, that a Control Rod dropped into the reactor core 55 minutes ago, that AP-RCC.3, Dropped Rod Recovery, has been carried out, and that the crew is currently in ER-RCC.1, Retrieval of a Dropped Rod, and has completed this procedure through Step 6.2.3. The operator will be directed to recover the dropped rod in accordance with ER-RCC.1, starting with Step 6.2.4. During the course of the procedure implementation the operator will discover that a second control rod drops into the core **(Alternate Path)**. The operator will be expected to attempt to recover the Control Rod per ER-RCC.1; and then manually trip the reactor during the recovery when it is diagnosed that two dropped rods exist.

JPM E This is a Bank JPM. The operator will be told that the plant is operating at 100% power, that the Electric Plant is currently in a 50/50 NORMAL lineup, and that RG&E ECC has requested that the plant be placed in a 100/0 lineup on Circuit 767 for scheduled maintenance on offsite Circuit 7T later today. The operator will be directed to establish a 100/0 Electric Plant alignment per Section 6.3 of O-6.9.2, Establishing and/or Transferring Offsite Power to Bus 12A/Bus 12B. The operator will be expected to Transfer 4160V buses from a 50/50 NORMAL Lineup to 100/0 Lineup on Circuit 767, recognize a failure of breaker 52/12AY to auto trip **(Alternate Path)**, and implement Attachment 1, 7T/Bus 12A Circulating Current Contingency Action, of O-6.9.2 to realign the electric plant to a 50/50 lineup. This JPM was on the N12-1R NRC Exam (One of Previous two NRC Exams).

JPM F This is a Bank JPM. The operator will be told that the plant is operating at 100% power, and that MCB Annunciator C-11, ACCUMULATOR 1A (LOOP B) PRESS 730 PSI 760, has alarmed. The operator will be directed to coordinate with the Equipment Operator and raise the pressure in the A Accumulator to 745 ±10 psig per S-16.2, Nitrogen Makeup to the SI Accumulators, using nitrogen cluster A. The operator will be expected to raise the A SI Accumulator pressure to 745±10 psig per S-16.2.

JPM G This is a Bank JPM. The operator will be told that the plant is operating at 100% power. That a Containment entry for maintenance is scheduled, that a Containment Mini-Purge Release has been approved, and that the Prerequisites of S-23.2.3, Containment Mini-Purge System Operation have been established for startup of the Containment Mini-Purge System. The operator will be directed to startup the Containment Mini-Purge System per S-23.2.3. The operator will be expected to start the Containment Mini-Purge System per S-23.2.3.

JPM I This is a Bank JPM. The operator will be told that plant was operating at 100% power when it experienced an SI coincident with a loss of all AC power, that the B EDG is now running and carrying approximately 1650 KW on Buses 16 and 17, that PRZR level is 20% and stable, that CNMT pressure is 0.4 psig and that SI has been RESET. The operator will be directed to energize a minimum 100 KW of PRZR BACKUP heaters per ER-PRZR.1, Restoration of PRZR Heaters During Blackout. The operator will be expected to energize a minimum of 100KW of PRZR Heaters in accordance with ER-PRZR.1. This JPM was on the N12-1R NRC Exam (One of Previous two NRC Exams).

JPM J This is a Bank JPM. The operator will be told that a fire in the Cable Tunnel is on-going, forcing the crew to implement ER-FIRE.2, Alternate Shutdown For Cable Tunnel Fire. The operator will be directed to The CRS has directed you to start and control the A Charging Pump in accordance with procedure ER-FIRE.2, Attachment 4, Section 8.0, until charging flow is verified to the RCS. The operator will be expected to start, control and initiate charging flow locally from the A Charging Pump per Attachment 4 of ER-FIRE.2.

JPM K This is a Bank JPM. The operator will be told that the plant has experienced a reactor trip signal and the crew entered procedure E-0, Reactor Trip or Safety Injection; and that the reactor trip could not be verified, and the crew entered FR-S.1, Response to Reactor Restart/ATWS. The operator will be directed to locally depress the trip pushbutton for BOTH Control Rod Drive Motor Generator Set Breakers at the CRDM Control Panel per the Step 1 RNO of FR-S.1. When the operator attempts to open the 52-2/MG1B Breaker, it will be discovered that this breaker will not trip; and the US will direct that the operator trip both of the Rx Trip Breakers locally. The operator will be expected to attempt to trip the Control Rod Drive Motor Generator Set Breaker(s); and when it is discovered that the 52-2/MG1B will not trip, manually trip both Rx Trip Breakers when directed.

Facility: Ginna		Date of Examination:	3/2017
Exam Level: SRO-U		Operating Test No.:	N17-1

Control Room Systems[@] (2 or 3 for SRO-U)

	System / JPM Title	Type Code*	Safety Function
A.	EPE E14 High Containment Pressure [EPE E14 EA1.1 (3.7/3.7)] Verify Containment Isolation and Heat Removal	S, P, D, A, EN	5
B.	003 Reactor Coolant Pump System [003 A4.01 (3.3/3.2)] Start an RCP during Plant Startup	S, D, A, L	4P
C.	059 Main Feedwater System [059 A2.12 (3.1/3.4)] Placing Main FRV in Auto when Bypass FRV is Controlling S/G Level in Auto	S, N, A	4S
D.	NA		
E.	NA		
F.	NA		
G.	NA		
H.	NA		

In-Plant Systems[@] (3 or 2 for SRO-U)

	System / JPM Title	Type Code*	Safety Function
I.	APE 056 Loss of Off-Site Power [APE 056 AA1.03 (3.2/3.3)] Energize a Minimum of 100 KW B/U Heaters onto EDG	P, D, R, E	6
J.	APE 067 Plant Fire On Site [APE 067 AA2.16 (3.3/4.0)] Take Local Manual Control of a Charging Pump	D, R, E	8
K.	NA		

@ 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 SRO-U
(A)lternate path	2-3 (3)
(C)ontrol room	
(D)irect from bank	≤ 4 (4)
(E)mergency or abnormal in-plant	≥ 1 (2)
(EN)gineered Safety Feature	≥ 1 (1) (Control Room System)
(L)ow-Power / Shutdown	≥ 1 (1)
(N)ew or (M)odified from bank including 1(A)	≥ 1 (1)
(P)revious 2 exams	≤ 2 (2) (Randomly Selected)
(R)CA	≥ 1 (2)
(S)imulator	

JPM Summary

JPM A This is a Bank JPM. The operator will be told that the plant tripped from 100% power and safety injection has actuated, that the crew entered E-0, Reactor Trip or Safety Injection, and then transitioned to E-2, Faulted Steam Generator Isolation, and that due to a degrading transient, an Orange Path now exists on the Containment Critical Safety Function Status Tree. The operator will be directed to verify Containment Isolation and Heat Removal systems are operating as expected by performing FR-Z.1, Response to High Containment Pressure, starting from Step 1. During the course of this action, the operator will recognize that two Containment Isolation Valves have failed to automatically close, and that the Containment Spray ESFAS Signal has failed to function. The operator will be expected to take action to verify Containment Isolation and Heat Removal systems are operating in accordance with Steps 1-3 of FR-Z.1. When the operator discovers that two Containment Isolation Valves have failed to close as expected the operator will close or direct that alternative valves be closed in accordance with ATT-3.0, Attachment CI/CVI. When it is revealed that one of the two actions on ATT-3.0 were unsuccessful at providing Containment Isolation **(Alternate Path)**, the operator will need to take actions to trip the Reactor Coolant Pumps, and close an alternate valve in the CCW System to fully achieve Containment Isolation. This JPM was on the N14-1 NRC Exam (One of Previous two NRC Exams).

JPM B This is a Bank JPM. The operator will be told that the plant is returning to service from a refueling outage, that the B RCP is running and that it is desired to start the A RCP. The operator will be directed to start the A RCP in accordance with O-1.1, Plant Heatup From Cold Shutdown to Hot Shutdown. Subsequent to the pump start an oil leak will develop on the pump motor **(Alternate Path).** The operator will be expected start the "A" RCP per O-1.1 and S-2.1, and then diagnose a low oil level in the pump, and stop the pump per plant Annunciator Response Procedures.

JPM C This is a New JPM. The operator will be told that the "A" Main Feed Regulating Bypass Valve is operating in AUTO to allow I&C to complete corrective maintenance on the A FRV Controller, and that the maintenance is now complete. The operator will be directed to Place the A FRV back in AUTO and to close the A FRV Bypass Valve IAW Attachment 2, CROI-1 Placing Bypass FRV in Auto and Main FRV in Manual, of P-17, Operations Control Room Operating Instructions. While closing the Bypass Valve the A FRV will fail to control in AUTO **(Alternate Path)**, and the operator will need to take manual control of the A FRV to control S/G level.

JPM I This is a Bank JPM. The operator will be told that plant was operating at 100% power when it experienced an SI coincident with a loss of all AC power, that the B EDG is now running and carrying approximately 1650 KW on Buses 16 and 17, that PRZR level is 20% and stable, that CNMT pressure is 0.4 psig and that SI has been RESET. The operator will be directed to energize a minimum 100 KW of PRZR BACKUP heaters per ER-PRZR.1, Restoration of PRZR Heaters During Blackout. The operator will be expected to energize a minimum of 100KW of PRZR Heaters in accordance with ER-PRZR.1. This JPM was on the N12-1R NRC Exam (One of Previous two NRC Exams).

JPM J This is a Bank JPM. The operator will be told that a fire in the Cable Tunnel is on-going, forcing the crew to implement ER-FIRE.2, Alternate Shutdown For Cable Tunnel Fire. The operator will be directed to The CRS has directed you to start and control the A Charging Pump in accordance with procedure ER-FIRE.2, Attachment 4, Section 8.0, until charging flow is verified to the RCS. The operator will be expected to start, control and initiate charging flow locally from the A Charging Pump per Attachment 4 of ER-FIRE.2.

Facility: Robert E Ginna Printed: 12/05/2016

Date Of Exam: 03/13/2017

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

3. Generic Knowledge And Abilities Categories	RO 1	RO 2	RO 3	RO 4	RO Total	SRO 1	SRO 2	SRO 3	SRO 4	SRO Total
	3	2	3	2	10	0	0	0	0	0

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 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).

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 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.

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' 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.

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.

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					AK2.01 - Valves	2.7*	1
000009 Small Break LOCA / 3			X				EK3.16 - Containment temperature, pressure, humidity and level limits	3.8	1
000011 Large Break LOCA / 3					X		EA2.06 - That fan is in slow speed and dampers are in accident mode during LOCA	3.7*	1
000015/000017 RCP Malfunctions / 4		X					AK2.07 - RCP seals	2.9	1
000025 Loss of RHR System / 4				X			AA1.09 - LPI pump switches, ammeter, discharge pressure gauge, flow meter, and indicators	3.2	1
000027 Pressurizer Pressure Control System Malfunction / 3						X	2.4.46 - Ability to verify that the alarms are consistent with the plant conditions.	4.2	1
000029 ATWS / 1		X					EK2.06 - Breakers, relays, and disconnects	2.9*	1
000055 Station Blackout / 6				X			EA1.04 - Reduction of loads on the battery	3.5	1
000056 Loss of Off-site Power / 6			X				AK3.02 - Actions contained in EOP for loss of offsite power	4.4	1
000057 Loss of Vital AC Inst. Bus / 6						X	2.4.21 - Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	4.0	1
000058 Loss of DC Power / 6	X						AK1.01 - Battery charger equipment and instrumentation	2.8	1
000062 Loss of Nuclear Svc Water / 4						X	2.4.11 - Knowledge of abnormal condition procedures.	4.0	1
000065 Loss of Instrument Air / 8			X				AK3.08 - Actions contained in EOP for loss of instrument air	3.7	1
000077 Generator Voltage and Electric Grid Disturbances / 6					X		AA2.03 - Generator current outside the capability curve	3.5	1
W/E04 LOCA Outside Containment / 3	X						EK1.3 - Annunciators and conditions indicating signals, and remedial actions associated with the LOCA Outside Containment	3.5	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.7	1

PWR RO Examination Outline

Printed: 12/05/2016

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
W/E11 Loss of Emergency Coolant Recirc. / 4				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.9	1
W/E12 - Steam Line Rupture - Excessive Heat Transfer / 4	X						EK1.3 - Annunciators and conditions indicating signals, and remedial actions associated with the Uncontrolled Depressurization of all Steam Generators	3.4	1
K/A Category Totals:	**3**	**3**	**3**	**3**	**3**	**3**	**Group Point Total:**		**18**

PWR RO Examination Outline

Printed: 12/05/2016

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
000003 Dropped Control Rod / 1	X						AK1.04 - Effects of power level and control position on flux	3.1	1
000028 Pressurizer Level Malfunction / 2		X					AK2.03 - Controllers and positioners	2.6	1
000037 Steam Generator Tube Leak / 3	X						AK1.02 - Leak rate vs. pressure drop	3.5	1
000060 Accidental Gaseous Radwaste Rel. / 9			X				AK3.03 - Actions contained in EOP for accidental gaseous-waste release	3.8	1
000067 Plant Fire On-site / 9				X			AA1.05 - Plant and control room ventilation systems	3.0	1
000068 Control Room Evac. / 8						X	2.4.31 - Knowledge of annunciator alarms, indications, or response procedures.	4.2	1
W/E06 Inad. Core Cooling / 4					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.4	1
W/E14 Loss of CTMT Integrity / 5		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.4	1
W/E15 Containment Flooding / 5				X			EA1.2 - Operating behavior characteristics of the facility	2.7	1
K/A Category Totals:	**2**	**2**	**1**	**2**	**1**	**1**	**Group Point Total:**		**9**

PWR RO Examination Outline

Printed: 12/05/2016

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							K5.02 - Effects of RCP coastdown on RCS parameters	2.8	1
004 Chemical and Volume Control						X						K6.24 - Controllers and positioners	2.5	1
005 Residual Heat Removal			X									K3.07 - Refueling operations	3.2*	1
006 Emergency Core Cooling		X										K2.04 - ESFAS-operated valves	3.6	1
007 Pressurizer Relief/Quench Tank					X							K5.02 - Method of forming a steam bubble in the PZR	3.1	1
007 Pressurizer Relief/Quench Tank										X		A4.04 - PZR vent valve	2.6*	1
008 Component Cooling Water										X		A4.10 - Conditions that require the operation of two CCW coolers	3.1*	1
008 Component Cooling Water							X					A1.01 - CCW flow rate	2.8	1
010 Pressurizer Pressure Control									X			A3.02 - PZR pressure	3.6	1
010 Pressurizer Pressure Control				X								K4.02 - Prevention of uncovering PZR heaters	3.0	1
012 Reactor Protection				X								K4.07 - First-out indication	3.0	1
013 Engineered Safety Features Actuation						X						K6.01 - Sensors and detectors	2.7*	1
022 Containment Cooling									X			A3.01 - Initiation of safeguards mode of operation	4.1	1
022 Containment Cooling		X										K2.01 - Containment cooling fans	3.0*	1
026 Containment Spray	X											K1.02 - Cooling water	4.1	1
039 Main and Reheat Steam	X											K1.07 - AFW	3.4*	1
039 Main and Reheat Steam							X					A1.10 - Air ejector PRM	2.9*	1
059 Main Feedwater	X											K1.04 - S/GS water level control system	3.4	1
061 Auxiliary/Emergency Feedwater				X								K4.08 - AFW recirculation	2.7	1
061 Auxiliary/Emergency Feedwater											X	2.2.38 - Knowledge of conditions and limitations in the facility license.	3.6	1
062 AC Electrical Distribution			X									K3.02 - ED/G	4.1	1
063 DC Electrical Distribution								X				A2.01 - Grounds	2.5	1
064 Emergency Diesel Generator								X				A2.18 - Consequences of premature opening of breaker under load	2.6*	1
073 Process Radiation Monitoring											X	2.4.45 - Ability to prioritize and interpret the significance of each	4.1	1

PWR RO Examination Outline

Printed: 12/05/2016

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
												annunciator or alarm.		
073 Process Radiation Monitoring							X					A1.01 - Radiation levels	3.2	1
076 Service Water								X				A2.01 - Loss of SWS	3.5*	1
078 Instrument Air	X											K1.02 - Service air	2.7*	1
103 Containment			X									K3.02 - Loss of containment integrity under normal operations	3.8	1
K/A Category Totals:	**4**	**2**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**2**	**Group Point Total:**		**28**

PWR RO Examination Outline

Printed: 12/05/2016

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										K2.02 - One-line diagram of power supply to trip breakers	3.6	1
002 Reactor Coolant				X								K4.02 - Monitoring reactor vessel level	3.5*	1
011 Pressurizer Level Control								X				A2.09 - High ambient reflux boiling temperature effect or indicated PZR level	2.9?	1
014 Rod Position Indication							X					A1.01 - Metroscope reed switch display	2.9*	1
015 Nuclear Instrumentation									X			A3.01 - Console and cabinet indications	3.8	1
027 Containment Iodine Removal	X											K1.01 - CSS	3.4*	1
035 Steam Generator					X							K5.01 - Effect of secondary parameters, pressure, and temperature on reactivity	3.4	1
068 Liquid Radwaste						X						K6.10 - Radiation monitors	2.5	1
072 Area Radiation Monitoring										X		A4.03 - Check source for operability demonstration	3.1	1
079 Station Air											X	2.1.20 - Ability to interpret and execute procedure steps.	4.6	1
K/A Category Totals:	**1**	**1**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**Group Point Total:**		**10**

Generic Knowledge and Abilities Outline (Tier 3)

PWR RO Examination Outline

Printed: 12/05/2016

Facility: Robert E Ginna

Form ES-401-3

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.	2.9*	1
	2.1.28	Knowledge of the purpose and function of major system components and controls.	4.1	1
	2.1.41	Knowledge of the refueling process.	2.8	1
		Category Total:		**3**
Equipment Control	2.2.6	Knowledge of the process for making changes to procedures.	3.0	1
	2.2.18	Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.	2.6	1
		Category Total:		**2**
Radiation Control	2.3.5	Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personal monitoring equipment, etc.	2.9	1
	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5	1
	2.3.11	Ability to control radiation releases.	3.8	1
		Category Total:		**3**
Emergency Procedures/Plan	2.4.13	Knowledge of crew roles and responsibilities during EOP usage.	4.0	1
	2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.	3.4	1
		Category Total:		**2**

Generic Total: **10**

Facility: Robert E Ginna Printed: 08/05/2016

Date Of Exam: 03/13/2017

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	0	0	0	N/A			0	0	N/A		0	0	3	3	6
	2	0	0	0				0	0			0	0	2	2	4
	Tier Totals	0	0	0				0	0			0	0	5	5	10
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5
	2	0	0	0	0	0	0	0	0	0	0	0	0	1 1	1	3
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0	5	3	8

3. Generic Knowledge And Abilities Categories	RO 1	RO 2	RO 3	RO 4	RO Total	SRO 1	SRO 2	SRO 3	SRO 4	SRO Total
	0	0	0	0	0	2	1	2	2	7

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 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).

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 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.

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' 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.

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.

PWR SRO Examination Outline

Printed: 08/05/2016

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
000007 Reactor Trip - Stabilization - Recovery / 1						X	2.4.6 - Knowledge of EOP mitigation strategies.	4.7	1
000022 Loss of Rx Coolant Makeup / 2						X	2.4.34 - Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	4.1	1
000026 Loss of Component Cooling Water / 8						X	2.2.40 - Ability to apply Technical Specifications for a system.	4.7	1
000038 Steam Gen. Tube Rupture / 3					X		EA2.06 - Shutdown margins and required boron concentrations	4.4	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4					X		AA2.02 - Conditions requiring a reactor trip	4.7	1
000054 Loss of Main Feedwater / 4					X		AA2.03 - Conditions and reasons for AFW pump startup	4.2	1
K/A Category Totals:	**0**	**0**	**0**	**0**	**3**	**3**	**Group Point Total:**		**6**

PWR SRO Examination Outline

Printed: 08/05/2016

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
000033 Loss of Intermediate Range NI / 7						X	2.4.8 - Knowledge of how abnormal operating procedures are used in conjunction with EOPs.	4.5	1
W/E01 Rediagnosis / 3					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.0	1
W/E07 Inad. Core Cooling / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.9	1
W/E16 High Containment Radiation / 9						X	2.4.34 - Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	4.1	1
K/A Category Totals:	**0**	**0**	**0**	**0**	**2**	**2**	**Group Point Total:**		**4**

PWR SRO Examination Outline

Printed: 08/05/2016

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
004 Chemical and Volume Control								X				A2.17 - Low PZR pressure	3.7	1
005 Residual Heat Removal								X				A2.04 - RHR valve malfunction	2.9	1
064 Emergency Diesel Generator											X	2.2.44 - Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.4	1
078 Instrument Air											X	2.4.20 - Knowledge of operational implications of EOP warnings, cautions, and notes.	4.3	1
103 Containment								X				A2.03 - Phase A and B isolation	3.8*	1
K/A Category Totals:	0	0	0	0	0	0	0	3	0	0	2	**Group Point Total:**		5

PWR SRO Examination Outline

Printed: 08/05/2016

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
034 Fuel Handling Equipment	X											K1.04 - NIS	3.5	1
075 Circulating Water											X	2.4.4 - Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	4.7	1
086 Fire Protection								X				A2.01 - Manual shutdown of the FPS	3.1	1
K/A Category Totals:	1	0	0	0	0	0	0	1	0	0	1	**Group Point Total:**		3

Generic Knowledge and Abilities Outline (Tier 3)

PWR SRO Examination Outline

Printed: 08/05/2016

Facility: Robert E Ginna

Form ES-401-3

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.6	Ability to manage the control room crew during plant transients.	4.8	1
	2.1.40	Knowledge of refueling administrative requirements.	3.9	1
		Category Total:		**2**
Equipment Control	2.2.44	Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.4	1
		Category Total:		**1**
Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.7	1
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.8	1
		Category Total:		**2**
Emergency Procedures/Plan	2.4.44	Knowledge of emergency plan protective action recommendations.	4.4	1
	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.4	1
		Category Total:		**2**

Generic Total: 7

Tier / Group	Randomly Selected K/A	Reason for Rejection
2 / 1	039 K1.07	K/A 039 2.2.39 rejected due to no Technical Specification Action Statements less than or equal to one hour exist for the Main Steam system. Determined number of K/As for System 039 (62) and randomly selected a numbered chip to get replacement K/A with an importance rating ≥ 2.5.

Facility:	**Ginna**	Scenario No.:	**1**	Op Test No.:	**N17-1**
Examiners:	______________	Operators:		______________	(SRO)
	______________			______________	(RO)
	______________			______________	(BOP)

Initial Conditions:	The plant is at 100% power (EOL). The area has experienced steady light rain for the past 4 hours, with light wind from the South at 5-10 mph, and this is expected to continue throughout the shift. Per the daily work schedule, CROI-7, Swapping Service Water Pumps, is to be performed this shift, swapping the C for the D Service Water pumps.
Turnover:	The following equipment is Out-Of-Service: The D SAFW Pump is OOS for breaker maintenance, and the Condensate Booster Pump A is OOS for thrust bearing replacement.

Event No.	Malf. No.	Event Type*	Event Description
1	1	C-BOP C(TS)-SRO	Swap Service Water Pumps/D Service Water Pump Trip
2	2	C-RO C(TS)-SRO	Leak on the CCW System/B CCW Pump Trips
3	3	I-BOP I-RO I(TS)-SRO	PZR Level Channel 427 fails LOW
4	4	R-RO N-BOP N-SRO	Turbine Control Valve CV-L4 Drifts Closed/Downpower
5	5	M-RO M-BOP M-SRO	Steamline Break in Intermediate Building/Delayed closure of MSIVs
6	6	C-RO C-SRO	Automatic Rx Trip fails
7	5	NA	MDAFW and TDAFW Pumps fail to start
8	NA	C-BOP C-SRO	D SAFW Pump is restored

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

Ginna 2017 NRC Scenario #1

The plant is at 100% power (EOL). The area has experienced steady light rain for the past 4 hours, with light wind from the South at 5-10 mph, and this is expected to continue throughout the shift. Per the daily work schedule, CROI-7, Swapping Service Water Pumps, is to be performed this shift, swapping the C for the D Service Water pumps.

The following equipment is Out-Of-Service: The D SAFW Pump is OOS for breaker maintenance, and the Condensate Booster Pump A is OOS for thrust bearing replacement.

Shortly after taking the watch, the operator will swap the C and the D Service Water Pumps in accordance with P-17, "Operations Control Room Operating Instructions." Because of restrictions on running four Service Water Pumps simultaneously, the operator will likely stop the C Service Water Pump prior to starting the D Service Water Pump. When the operator stops the C Service Water Pump, its Discharge Check Valve will stick partially open, resulting in lower system pressure, even after the D Service Water Pump is started. The operator may restart the pump based on these indications, or enter AP-SW.1, "Service Water Leak." When the C SW Pump is re-started the D Service Water Pump will trip. The operator will respond in accordance with AR-J-9, "SAFEGUARDS BREAKER TRIP," and AP-SW.2, "Loss of Service Water." The operator will address Technical Specification LCO 3.7.8, "Service Water (SW) System."

Following this, a CCW System Supply Relief Valve will lift and fail to reseat causing a 30 gpm CCW System leak. Approximately two minutes afterwards the B CCW Pump will trip, and the A CCW Pump will automatically start. The operator will respond in accordance with AR-A-17, "MOTOR OFF RCP CCWP," and enter AP-CCW.2, "Loss of CCW During Power Operation." The operator will address Technical Specification LCO 3.7.7, "Component Cooling Water System."

Subsequently, Pressurizer Level Channel 427 will fail LOW, resulting in letdown isolation and de-energizing the pressurizer heaters. The crew will respond per AR-F-11, "PZR LOW LEVEL 13%," and ER-INST.1, "Reactor Protection Bistable Defeat After Instrumentation Loop Failure." They will defeat the failed channel, reset PZR heaters, reduce charging to a single charging pump, and re-establish letdown per S-3.2.E, "Placing In or Removing From Service Normal Letdown/Excess Letdown." The crew will start a second charging pump and slowly restore PZR level to program (52%). The operator will address Technical Specification LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation" and LCO 3.4.9, "Pressurizer."

Then, turbine control valve CVL-4 will drift closed. The crew will respond per AP-TURB.2, "Turbine Load Rejection," begin a load reduction to less than 50% power using AP-TURB.5, "Rapid Load Reduction."

After this, a large steam feed break occurs downstream of the MSIVs in the Intermediate Building, and both MSIVs will fail to automatically of manually close. Simultaneously, the reactor will fail to trip automatically. The operator will need to manually trip the Reactor. Additionally, all AFW pumps fail to start due to the high-energy break. The crew will implement E-0, "Reactor Trip or Safety Injection."

Both MSIVs will automatically close after 90 seconds. The crew will transition to FR-H.1, "Response to Loss of Secondary Heat Sink," at Step 9 of E-0; and will be required to initiate RCS Bleed and Feed. Upon successful implementation of RCS Bleed and Feed, the D SAFW Pump will become available, and the crew will restore a feed source to the B S/G in accordance with ATT-22.0, "Attachment Restoring Feed Flow."

The scenario will terminate at Step 27.b of FR-H.1, after feed flow has been restored from the D SAFW Pump.

<u>Critical Tasks:</u>

Restore normal letdown during the failure of the PRZR level instrument before the Reactor automatically trips due to high pressurizer level.

Safety Significance: failure to control pressurizer level and stop the level transient, under the postulated plant conditions, results in an unnecessary transient to the plant and challenge to the Reactor Protection System. Performance of the critical task would stabilize the level transient. A failure to stabilize the level transient, when able to do so, constitutes a mis-operation or incorrect crew performance which leads to incorrect RCS pressure control.

Manually trip the reactor from the control room before transition to FR-S.1 (EOP Based)

Safety Significance: Failure to manually trip the reactor causes a challenge to the subcriticality CSF beyond that irreparably introduced by the postulated conditions. Additionally, it constitutes an "incorrect performance that necessitates the crew taking action which complicates the event mitigation strategy that demonstrates the inability by the crew to recognize a failure of the automatic actuation of the RPS.

Establish RCS bleed and feed so that the RCS depressurizes sufficiently such that the SI Pumps inject flow (EOP-Based)

Safety Significance: Failure to initiate RCS bleed and feed before the RCS saturates at a pressure above the shutoff head of the high-head ECCS pumps results in significant and sustained core uncovery. If RCS bleed is initiated so that the RCS is depressurized below the shutoff head of the high-head ECCS pumps, then core uncovery is prevented or minimized.

Facility:	**Ginna**	Scenario No.: **3**	Op Test No.: **N17-1**
Examiners:		Operators:	(SRO)
			(RO)
			(BOP)

Initial Conditions:	The plant is at 70% power (BOL). The plant was taken to 50% due to a failure of the B MFW Pump. Corrective Maintenance was performed and plant power raised to 70% four days ago. It is intended to observe the B MFW operation for two more days at this power level and then raise power to 100%. The area has experienced steady light rain for the past 4 hours, with light wind from the South at 5-10 mph, and this is expected to continue throughout the shift. It is expected to perform post-maintenance testing on the B RHR Pump on this shift.
Turnover:	The following equipment is Out-Of-Service: The A Control Rod Shroud Fan is OOS for breaker maintenance, and the Condensate Booster Pump A is OOS for thrust bearing replacement.

Event No.	Malf. No.	Event Type*	Event Description
1	1	C-RO C(TS)-SRO	Failure of B RHR Pump During Surveillance
2	2	C-BOP C-SRO	A ARV Fails OPEN (3411)
3	3	I-RO I(TS)-SRO	Master Pressure Controller (431K) Fails HIGH
4	NA	R-RO N-BOP N-SRO	Unscheduled Trip of Transmission Circuits/Downpower
5	4	C-BOP C-SRO	B FRV fails AS-IS (Manual Control Available)
6	5	M-RO M-BOP M-SRO	Ejected Control Rod
7	6	C-BOP C-SRO	Failure of Turbine to Trip on Rx Trip
8	7	C-RO C-SRO	Failure of A and B SI Pumps to Auto Start
9	8	NA	A RHR Pumps trips

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

<u>Ginna 2017 NRC Scenario #3</u>

The plant is at 70% power (BOL). The plant was taken to 50% due to a failure of the B MFW Pump. Corrective Maintenance was performed and plant power raised to 70% four days ago. It is intended to observe the B MFW operation for two more days at this power level and then raise power to 100%. The area has experienced steady light rain for the past 4 hours, with light wind from the South at 5-10 mph, and this is expected to continue throughout the shift. It is expected to perform post-maintenance testing on the B RHR Pump on this shift.

The following equipment is Out-Of-Service: The A Control Rod Shroud Fan is OOS for breaker maintenance, and the Condensate Booster Pump A is OOS for thrust bearing replacement.

Shortly after taking the watch, the operator will start the B RHR Pump per STP-O-2.2.-COMP-B, "Residual Heat Removal Pump B Comprehensive Test," and then stop the pump due to a pump seal water cooler failure using the guidance of A-503.1, "Emergency and Abnormal Operating Procedures User's Guide." The operator will respond using AP-CCW.2, "Loss of CCW During Power Operation." The operator will address Technical Specification LCO 3.5.2, "ECCS - MODES 1, 2, and 3."

Following this, the controller for the A SG ARV will fail such that the valve will travel to the full OPEN position. The operator will respond using A-503.1, "Emergency and Abnormal Operating Procedures Users Guide," and/or AP-FW.2, "Secondary Coolant Leak," and take manual control of the ARV-3411, and close the valve.

Subsequently, the Master Pressure Controller (431K) will fail such that the output in Automatic goes to 100%, causing both Pressurizer Spray Valves to OPEN, and RCS Pressure to LOWER. The operator will respond using AR-F-10, "PRESSURIZER LO PRESS 2205 PSI," and enter AP-PRZR.1, "Abnormal Pressurizer Pressure." The operator will address Technical Specification LCO 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits," and Technical Requirements Manual TR-3.4.3, "Anticipated Transients Without Scram (ATWS) Mitigation."

Then, the off-site transmission circuit 908 will de-energize, and the RG&E Energy Control Center (ECC) will request that Ginna verbally certify that the plant is capable of ramping down to 360 MWe net generation in 14 minutes upon Subsequent notification from ECC. The operator will respond in accordance with AR-J-28, "STATION 13A TROUBLE," enter O-6.9, "Operating Limits for Ginna Station Transmission," and prepare for plant shutdown. After this, the off-site transmission circuit 913 will also de-energize and the ECC will call requesting that the previously agreed to downpower be executed. The operating crew will enter AP-TURB.5, "Rapid Load Reduction," and lower plant power to 340 MWe.

During the load reduction, a failure of the B FRV to control in AUTO will occur. The operator will respond per AR-G-5, "S/G/ B LEVEL DEVIATION ±7%," or upon observing an abnormally high level in the B Steam Generator and control the B FRV manually.

After this, Shutdown Bank Control Rod K-9 will be ejected from the core causing a LOCA, and an automatic Rx Trip/SI signal will occur. On the trip the Main Turbine will fail to trip, and the operator will need to manually trip the Turbine. Additionally, the A and the B SI Pumps will fail to start automatically. The operator will be required to manually start both SI Pumps. The operator will enter E-0, "Reactor Trip or Safety Injection," and transition to E-1, "Loss of Reactor or Secondary Coolant."

Shortly after transition to E-1 the A RHR Pump will trip. The operator will transition to ECA-1.1, "Loss of Emergency Coolant Recirculation," due to a loss of both RHR Pumps. The operator will take actions to minimize the inventory loss from the RWST.

The scenario will terminate at Step 10.a RNO of ECA-1.1, after the crew has stopped one SI Pump.

Critical Tasks:

Manually control PRZR pressure during the failure of the Master Pressure Controller before the Reactor automatically trips due to low pressurizer pressure

Safety Significance: failure to control PRZR pressure and stop the pressure transient, under the postulated plant conditions, results in an unnecessary transient to the plant and challenge to the Reactor Protection System. Performance of the critical task would stabilize the pressure transient. A failure to stabilize the pressure transient, when able to do so, constitutes a mis-operation or incorrect crew performance which leads to incorrect RCS pressure control.

Manually control the B S/G level during the failure of the B FRV Controller before the Reactor automatically trips due to low S/G level or Feedwater Isolates due to high S/G level

Safety Significance: failure to control B S/G level and stop the level transient, under the postulated plant conditions, results in an unnecessary transient to the plant and challenge to the Reactor Protection System. Performance of the critical task would stabilize the level transient. A failure to stabilize the level transient, when able to do so, constitutes a mis-operation or incorrect crew performance which leads to incorrect RCS temperature and/or pressure control.

Trip all RCPs within 5 minutes of reaching trip criteria (EOP-Based)

Safety Significance: Failure to trip all RCPs when required can lead to core uncovery and to fuel temperatures in excess of 2200°F. Analyses have shown that if the RCPs are tripped within 5 minutes of the trip criteria being met, PCT will remain below 2200°F, and if this action is delayed beyond 5 minutes, this PCT will be exceeded. It is a management expectation that the RCPs be tripped as quickly as possible, but within 5 minutes when the trip criteria is met. Failure to take this action represents mis-operation by the operator which leads to degradation of the fuel cladding fission produce barrier, and a violation of a license condition.

Direct that actions be taken to prepare to establish, or establish Makeup to RWST; and minimize RWST outflow (EOP-Based)

Safety Significance: Under the postulated plant conditions, failure to establish makeup flow to the RWST and/or to minimize RWST outflow leads to (or accelerates) depletion of RWST inventory to the point at which ECCS pumps taking suction on the RWST must be stopped. Loss of pumped injection (coincident with loss of emergency cooling recirculation) will lead to a severe or an extreme challenge to the core cooling CSF. Failure to perform the critical task causes these challenges to occur needlessly or, at best, prematurely (that is, before they would occur if the critical task is performed). Thus, failure to perform the critical task under the postulated plant conditions leads to "a significant reduction of safety margin beyond that irreparably introduced by the scenario." It also represents a demonstrated inability by the crew to "take one or more actions that would prevent a challenge to plant safety."

Facility:	**Ginna**	Scenario No.:	**5**	Op Test No.:	**N17-1**
Examiners:	____________	Operators:		____________	(SRO)
	____________			____________	(RO)
	____________			____________	(BOP)

Initial Conditions:	The plant is at 48% power (MOL). The plant was taken to 50% due to a failure of the B MFW Pump. Station Management has decided to shutdown the plant and repair the pump. The area has experienced steady light rain for the past 4 hours, with light wind from the South at 5-10 mph, and this is expected to continue throughout the shift. The crew is expected to lower power and proceed to Mode 3 on this shift.
Turnover:	The following equipment is Out-Of-Service: The B MFW is OOS for bearing replacement, and the Condensate Booster Pump A is OOS for thrust bearing replacement.

Event No.	Malf. No.	Event Type*	Event Description
1	1	C-RO C-BOP C(TS)-SRO	Loss of B Instrument Bus
2	NA	R-RO N-BOP N-SRO	Load Reduction
3	2	C-RO C(TS)-SRO	PORV Leak/Block Valve Failure
4	3	C-BOP C-SRO	Downpower/Failure of Turbine Control/EHC
5	4	M-RO M-BOP M-SRO	Inadvertent Main Steam Line Isolation Signal
6	5	C-RO C-BOP C-SRO	Failure of the Reactor to trip from the Control Room/ATWS
7	6	NA	One S/G Safety Valve on each S/G Lifts and sticks partially OPEN

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

Ginna 2017 NRC Scenario #5

The plant is at 48% power (MOL). The plant was taken to 50% due to a failure of the B MFW Pump. Station Management has decided to shutdown the plant and repair the pump. The area has experienced steady light rain for the past 4 hours, with light wind from the South at 5-10 mph, and this is expected to continue throughout the shift. The crew is expected to lower power and proceed to Mode 3 on this shift.

The following equipment is Out-Of-Service: The B MFW is OOS for bearing replacement, and the Condensate Booster Pump A is OOS for thrust bearing replacement.

Shortly after taking the watch, the operator will attempt to lower power in accordance with O-5.1, "Load Reduction," however, a loss of the B Instrument Bus will occur prior to the start of the load reduction. The operator will respond in accordance with AR-E-14, "LOSS B INSTR. BUS." Power will be restored to the bus per guidance in ER-INST.3, "Instrument Bus Power Restoration," which will include the isolation and re-establishment of Normal Letdown in accordance with S-3.2E, "Placing In or Removing From Service Normal Letdown/Excess Letdown." The operator will address AR-K-32, "CV AIR DRYER LOW PRESS SG B/D TANK HIGH LEVEL," while restoring from the transient. The operator will address Technical Specification LCO 3.8.7, "AC Instrument Bus Sources Modes 1-4," and LCO 3.8.9, "Distribution Systems – Modes 1, 2, 3 and 4."

Following this, the operator will lower power in accordance with O-5.1, "Load Reduction." The operator will address S-3.1, "Boron Concentration Control," to start the load reduction.

Subsequently, Pressurizer PORV-431C will fail partially open. The operator will respond in accordance with AR-F-19, "PRZR PORV OUTLET HI TEMP 145°F," and enter AP-PRZR.1, "Abnormal Pressurizer Pressure." When the operator attempts to isolate the PORV, the Block Valve will fail to shut fully resulting in a 2-5 gpm leak into the PRT. The crew may implement AP-RCS.1, "Reactor Coolant Leak," and prepare to make a Containment entry. Ultimately, the crew will be directed to take the unit off-line. The operator will address Technical Specification LCO 3.4.11, "Pressurizer Power Operated Relief Valves," LCO 3.4.13, "RCS Operational Leakage," LCO 3.4.1 "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits," as well as Technical Requirements Manual TR 3.4.3, "Anticipated Transients Without Scram (ATWS) Mitigation."

Then, the operator will take the unit off line in accordance with AP-TURB.5, "Rapid Load Reduction." During the downpower, the Main Turbine will fail in automatic control, and shift to manual control. The operator will identify that the load reduction has been stopped, and use manual control of the turbine to restart and continue the downpower. The remainder of the downpower will need to be accomplished using manual control of the Turbine.

After this, an inadvertent Main Steam Line Isolation Signal will occur and both MSIVs will close. The reactor will fail to automatically trip and the operator will attempt to trip the reactor manually. The crew will enter E-0, "Reactor Trip or Safety Injection."

The reactor will fail to trip manually from the control room, and the crew will enter FR-S.1, "Response to Reactor Restart/ATWS." On the trip one S/G Safety Valve on each S/G lifted and stuck partially OPEN.

The crew will successfully de-energize the Rod Drive MG set(s) causing to control rods to drop into the core. Upon completion of FR-S.1, the crew will transition back to E-0, and then to E-1, "Loss of Reactor or Secondary Coolant," based on the failed Pressurizer PORV and Block Valve.

Shortly after entry into E-1, the crew will transition to E-2, "Faulted Steam Generator Isolation." While implementing E-2, the crew will recognize that both S/Gs are faulted and transition to ECA-2.1, "Uncontrolled Depressurization of Both Steam Generators." The crew may take a pre-emptive action of throttling AFW flow to both S/Gs per A-503.1, "Emergency and Abnormal Operating Procedures Users Guide."

The scenario will terminate at Step 16 of ECA-2.1, after the crew has correctly determined whether plant conditions meet SI Termination criteria.

<u>Critical Tasks:</u>

Manually control PRZR pressure during the failure of the PRZR PORV before the Reactor automatically trips due to low pressurizer pressure

Safety Significance: failure to control PRZR pressure and stop the pressure transient, under the postulated plant conditions, results in an unnecessary transient to the plant and challenge to the Reactor Protection System. Performance of the critical task would stabilize the pressure transient. A failure to stabilize the pressure transient, when able to do so, constitutes a mis-operation or incorrect crew performance which leads to incorrect RCS pressure control.

Upon diagnosing an ATWS, manually insert the control rods within 1 minute, and continue insertion until the reactor is tripped or the rods are on the bottom (EOP-Based)

Safety Significance: failure to insert negative reactivity, under the postulated plant conditions, results in an unnecessary situation in which the reactor power remains higher than it otherwise would if the action is taken. Performance of the critical task would move the reactor power lower to prevent a subsequent an unnecessary challenge to reactor core operational limits. A failure to insert negative reactivity constitutes a mis-operation or incorrect crew performance which leads to incorrect reactivity control.

Control the AFW flowrate to 50 gpm per SG in order to minimize the RCS Cooldown rate before an extreme challenge (Red Path) develops to the integrity CSF (EOP-Based)

Safety Significance: Failure to control the AFW flow rate to the SGs leads to an unnecessary and avoidable extreme challenge to the integrity CSF. Also, failure to perform the Critical Task increases challenges to the SUBCRITICALITY Critical Safety Function which otherwise would not occur.

Facility: **Ginna**		Scenario No.: **6**	Op Test No.: **N17-1**
Examiners:	____________	Operators:	____________ (SRO)
	____________		____________ (RO)
	____________		____________ (BOP)

Initial Conditions:	The plant is at 0.5% power (BOL). The area has experienced steady light rain for the past 4 hours, with light wind from the South at 5-10 mph, and this is expected to continue throughout the shift. The crew will raise and stabilize plant power between 2-3%; until maintenance on the A SI Pump is complete.
Turnover:	The following equipment is Out-Of-Service: The A SI Pump is OOS for bearing replacement, and the Condensate Booster Pump A is OOS for thrust bearing replacement.

Event No.	Malf. No.	Event Type*	Event Description
1	NA	R-RO N-BOP N-SRO	Raise power and Start second AFW Pump
2	1	C-BOP C(TS)-SRO	Loss of Compensating Voltage to Intermediate Range N35
3	2	C-RO C(TS)-SRO	480VAC Ground/A CCW Pump trips w/B CCW Pump failure to start in AUTO
4	3	C-RO C(TS)-SRO	B RCP Thermal Barrier leak
5	4	C-BOP C(TS)-SRO	Fault on 480V Bus 17/SW Pump C fails to start
6	5	M-RO M-BOP M-SRO	PRZR Steam Space Break
7	6	C-RO C-SRO	CI fails to automatically/manually actuate
8	7	C-RO C-BOP C-SRO	Loss of Off-site Power after SI is Reset
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Ginna 2017 NRC Scenario #6

The plant is at 0.5% power (BOL). The area has experienced steady light rain for the past 4 hours, with light wind from the South at 5-10 mph, and this is expected to continue throughout the shift. The crew will raise and stabilize plant power between 2-3%; until maintenance on the A SI Pump is complete.

The following equipment is Out-Of-Service: The A SI Pump is OOS for bearing replacement, and the Condensate Booster Pump A is OOS for thrust bearing replacement.

Shortly after taking the watch, the crew initiate a Steam Header Warmup per Section 6.5 of O-1.2, "Plant Startup From Hot Shutdown To Full Load." Reactor power will be raised and stabilized between 2-3 %, and the crew will start the 2^{nd} AFW Pump and control S/G levels.

Subsequently, the compensating voltage power supply for the Intermediate Range Nuclear Instrument N35 will fail Low. The operator will respond in accordance with AR-E-9, "IR N-35 LOSS OF COMPENSATING VOLTAGE," and enter ER-NIS.2, "IR MALFUNTION." The operator will address Technical Specification LCO 3.3.1, "Reactor Trip Instrumentation."

Then, a 480VAC ground will occur on Bus 14 and the A CCW Pump will trip, and the B CCW Pump will fail to automatically start. The operator will either start the A CCW pump manually per A-503.1, "Emergency and Abnormal Operating Procedures Users Guide," or respond in accordance with AR-A-22, "CCW PUMP DISCHARGE LO PRESS 60 PSI," and enter AP-CCW.2, "Loss of CCW During Power Operation." The operator will evaluate Technical Specification LCO 3.7.7, "Component Cooling Water System."

After this, a thermal barrier leak will occur on the B RCP. The crew may enter AP-RCP.1, "RCP Seal Malfunction," but will ultimately respond per AP-CCW.1, "Leakage Into the Component Cooling Loop," and isolate the leak. The operator will address Technical Specification LCO 3.4.13, "RCS Operational Leakage."

Next, a fault on 480V Bus 17 will occur, resulting in Bus 17 de-energizing. The operator will enter AP-ELECT.17/18, "Loss of Safeguards Bus 17/18." The C Service Water Pump will fail to start when manual start is attempted, leaving only the A SW Pump running. The operator may leave the B EDG running or trip it within AP-ELECT.17/18, but in either case align Alternate Cooling to the EDG. The operator will enter AP-SW.2, "Loss of Service Water," and take actions to isolate non-essential SW loads. The operator will address Technical Specification LCO 3.8.1, "AC Sources – Modes 1, 2, 3, and 4," LCO 3.8.9, "Distribution Systems – Modes 1, 2, 3,and 4," and 3.7.8, "Service Water System."

Afterwards, a Pressurizer vapor space Small Break LOCA occurs. The plant will trip and Safety Injection will be actuated, and the operator will enter E-0, "Reactor Trip or Safety Injection." On the plant trip, Containment Isolation will fail to automatically and manually actuate, and the operator will need to manually close the Containment Isolation Valves. Additionally, when the SI occurs, instrument air to containment will be isolated and the B RCP Thermal Barrier Return Isolation Valve will fail open. The CCW leak will need to be re-isolated.

The operator will transition from E-0 to E-1, "Loss of Reactor or Secondary Coolant." At Step 7 of E-1, and after SI is reset, a Loss of Off-Site Power will occur and all Safeguards Equipment will need to be re-started.

The scenario will terminate at Step 9 (or beyond) of E-1 after all ECCS equipment is re-started and Instrument Air has been restored to the Containment.

Critical Tasks:

Trip all RCPs within 5 minutes of reaching trip criteria (EOP-Based)

Safety Significance: Failure to trip all RCPs when required can lead to core uncovery and to fuel temperatures in excess of 2200°F. Analyses have shown that if the RCPs are tripped within 5 minutes of the trip criteria being met, PCT will remain below 2200°F, and if this action is delayed beyond 5 minutes, this PCT will be exceeded. It is a management expectation that the RCPs be tripped as quickly as possible, but within 5 minutes when the trip criteria is met. Failure to take this action represents mis-operation by the operator which leads to degradation of the fuel cladding fission produce barrier, and a violation of a license condition.

Close Containment Isolation Phase A Valves before transition out of E-0 (EOP-Based)

Safety Significance: Failure to close at least one Containment Isolation Valve on each critical penetration under the postulated conditions when it is possible to do so, constitutes mis-operation leading to degradation of the Containment Barrier. Failure to take this action leads to an unnecessary release of fission products to the auxiliary building, increasing the potential for release to the environment, and reducing accessibility to vital equipment within the Auxiliary Building. Higher radiation levels within the Auxiliary Building will result in a degradation of ALARA principles.

Establish High-Head Injection with at least two SI Pumps after SI has been Reset and following a Loss of Off-Site Power (EOP-Based)

Safety Significance: Failure to manually start at least two 50% capacity SI pumps under the postulated conditions constitutes mis-operation or incorrect crew performance in which the crew does not prevent degraded emergency core cooling system (ECCS) ... capacity." In this case, at least two SI pumps can be manually started from the control room. Therefore, failure to manually start both SI pumps, which are 50% capacity pumps, also represents a failure by the crew to "demonstrate the ability to effectively direct or manipulate engineered safety feature (ESF) controls that would prevent a significant reduction of safety margin beyond that irreparably introduced by the scenario, and recognize a failure or an incorrect automatic actuation of an ESF system or component. Additionally, under the postulated plant conditions, failure to manually start the SI pumps (when it is possible to do so) is a "violation of the facility license condition." Performance of the critical task would return the plant to a condition for which analysis shows acceptable results.