

Facility: R.E. Ginna Nuclear Power Plant

Form ES-401-3

Exam Date: 02/08/2002**Exam Level:** SRO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	4	4	4				4	4			4	24
	2	2	3	3				3	2			3	16
	3	0	1	0				0	1			1	3
	Tier Totals	6	8	7				7	7			8	43
2. Plant Systems	1	1	2	2	2	2	1	2	2	2	1	2	19
	2	2	1	2	1	2	1	2	2	1	1	2	17
	3	0	1	0	0	0	1	0	0	1	0	1	4
	Tier Totals	3	4	4	3	4	3	4	4	4	2	5	40
3. Generic Knowledge And Abilities					Cat 1		Cat 2		Cat 3		Cat 4		
					4		5		4		4		17

Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each

2. Actual point totals must match those specified in the table.

3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless

4. Systems/evolutions within each group are identified on the associated outline.

5. The shaded areas are not applicable to the category/tier.

6. The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be

7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be

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PWR SRO Exam Outline

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Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

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E/APE #	E/APE Name / Safety Function	KA	KA Topic	Comment
001	Continuous Rod Withdrawal / 1	AK3.02	Tech-Spec limits on rod operability	
003	Dropped Control Rod / 1	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	
003	Dropped Control Rod / 1	AK2.05	Control rod drive power supplies and logic circuits	
005	Inoperable/Stuck Control Rod / 1	AA2.01	Stuck or inoperable rod from in-core and ex-core NIS, in-core or loop temperature measurements	
011	Large Break LOCA / 3	EK2.02	Pumps	
015	Reactor Coolant Pump (RCP) Malfunctions / 4	AK2.07	RCP seals	
029	Anticipated Transient Without Scram (ATWS) / 1	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	
040	Steam Line Rupture / 4	AA2.05	When ESFAS systems may be secured	
040	Steam Line Rupture / 4	AA1.01	Manual and automatic ESFAS initiation	
057	Loss of Vital AC Electrical Instrument Bus / 6	AA2.03	RPS panel alarm annunciators and trip indicators	
057	Loss of Vital AC Electrical Instrument Bus / 6	AA1.01	Manual inverter swapping	

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E/APE #	E/APE Name / Safety Function	KA	KA Topic	Comment
068	Control Room Evacuation / 8	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	
068	Control Room Evacuation / 8	AK3.02	System response to turbine trip	
069	Loss of Containment Integrity / 5	AK3.01	Guidance contained in EOP for loss of containment integrity	
E01	Radiagnosis / 3	2.4.6	Knowledge symptom based EOP mitigation strategies.	
E01	Radiagnosis / 3	EK1.1	Components, capacity, and function of emergency systems	
E02	SI Termination / 3	EK3.1	Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics	Similar to E02 EA1.2
E02	SI Termination / 3	EA1.2	Operating behavior characteristics of the facility	Similar to E02 EK3.1
E04	LOCA Outside Containment / 3	EA2.2	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	
E07	Saturated Core Cooling / 4	EK1.3	Annunciators and conditions indicating signals, and remedial actions associated with the Saturated Core Cooling	
E08	Pressurized Thermal Shock / 4	EA1.1	Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	

interlocks, failure modes, and automatic and manual features

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E/APE #	E/APE Name / Safety Function	KA	KA Topic	Comment
E09	Natural Circulation Operations / 4	EK1.1	Components, capacity, and function of emergency systems	Similar to E09 EK2.1
E09	Natural Circulation Operations / 4	EK2.1	Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	Similar to E09 EK1.1
E14	High Containment Pressure / 5	EK1.2	Normal, abnormal and emergency operating procedures associated with High Containment Pressure	

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Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

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E/APE #	E/APE Name / Safety Function	KA	KA Topic	Comment
007	Reactor Trip / 1	EK2.02	Breakers, relays and disconnects	
008	Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open) / 3	2.1.30	Ability to locate and operate components, including local controls.	
009	Small Break LOCA / 3	EK1.01	Natural circulation and cooling, including reflux boiling	
009	Small Break LOCA / 3	EK2.03	S/Gs	
027	Pressurizer Pressure Control (PZR PCS) Malfunction / 3	AA2.18	Operable control channel	
027	Pressurizer Pressure Control (PZR PCS) Malfunction / 3	AK2.03	Controllers and positioners	
033	Loss of Intermediate Range Nuclear Instrumentation / 7	AA1.03	Manual restoration of power	
037	Steam Generator (S/G) Tube Leak / 3	2.2.22	Knowledge of limiting conditions for operations and safety limits.	
037	Steam Generator (S/G) Tube Leak / 3	AK3.08	Criteria for securing RCP	
038	Steam Generator Tube Rupture (SGTR) / 3	EK1.04	Reflux boiling	
060	Accidental Gaseous Radwaste Release / 9	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	

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E/APE #	E/APE Name / Safety Function	KA	KA Topic	Comment
065	Loss of Instrument Air / 8	AA1.02	Components served by instrument air to minimize drain on system	
E03	LOCA Cooldown and Depressurization / 4	EA2.2	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	
E11	Loss of Emergency Coolant Recirculation / 4	EK3.3	Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations	
E16	High Containment Radiation / 9	EK3.2	Normal, abnormal and emergency operating procedures associated with High Containment Radiation	
E16	High Containment Radiation / 9	EA1.1	Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	

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Emergency and Abnormal Plant Evolutions - Tier 1 / Group 3

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E/APE #	E/APE Name / Safety Function	KA	KA Topic	Comment
028	Pressurizer (PZR) Level Control Malfunction / 2	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	
028	Pressurizer (PZR) Level Control Malfunction / 2	AK2.03	Controllers and positioners	
036	Fuel Handling Incidents / 8	AA2.01	ARM system indications	

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Plant Systems - Tier 2 / Group 1

Form ES-401-3

Sys/Ev #	System / Evolution Name	KA	KA Topic	Comment
001	Control Rod Drive System / 1	K1.04	RCS	
003	Reactor Coolant Pump System (RCPS) / 4	K3.04	RPS	
003	Reactor Coolant Pump System (RCPS) / 4	A1.05	RCS flow	
004	Chemical and Volume Control System (CVCS) / 1	K5.14	Reduction process of gas concentration in RCS: vent-accumulated non-condensable gases from PZR bubble space, depressurized during cooldown or by alternately heating and cooling (spray) within allowed pressure band (drive more gas out of solution)	
004	Chemical and Volume Control System (CVCS) / 1	A1.05	S/G pressure and level	-
013	Engineered Safety Features Actuation System (ESFAS) / 2	K2.01	ESFAS/safeguards equipment control	
013	Engineered Safety Features Actuation System (ESFAS) / 2	K6.01	Sensors and detectors	
014	Rod Position Indication System (RPIS) / 1	K3.02	Plant computer	
017	In-Core Temperature Monitor (ITM) System / 7	A2.01	Thermocouple open and short circuits	
022	Containment Cooling System (CCS) / 5	2.2.22	Knowledge of limiting conditions for operations and safety limits.	
022	Containment Cooling System (CCS) / 5	A4.04	Valves in the CCS	

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Plant Systems - Tier 2 / Group 1

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Sys/Ev #	System / Evolution Name	KA	KA Topic	Comment
026	Containment Spray System (CSS) / 5	2.4.30	Knowledge of which events related to system operations/status should be reported to outside agencies.	
026	Containment Spray System (CSS) / 5	K4.05	Prevention of material from clogging nozzles during recirculation	
059	Main Feedwater (MFW) System / 4	K4.16	Automatic trips for MFW pumps	
059	Main Feedwater (MFW) System / 4	A2.05	Rupture in MFW suction or discharge line	
063	D.C. Electrical Distribution System / 6	K2.01	Major DC loads	
068	Liquid Radwaste System (LRS) / 9	A3.02	Automatic isolation	
072	Area Radiation Monitoring (ARM) System / 7	K5.02	Radiation intensity changes with source distance	
072	Area Radiation Monitoring (ARM) System / 7	A3.01	Changes in ventilation alignment	

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Plant Systems - Tier 2 / Group 2

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Sys/Ev #	System / Evolution Name	KA	KA Topic	Comment
002	Reactor Coolant System (RCS) / 2	K5.09	Relationship of pressure and temperature for water at saturation and subcooling conditions	
002	Reactor Coolant System (RCS) / 2	K6.03	Reactor vessel level indication	
010	Pressurizer Pressure Control System (PZR PCS) / 3	2.1.14	Knowledge of system status criteria which require the notification of plant personnel.	
010	Pressurizer Pressure Control System (PZR PCS) / 3	K2.01	PZR heaters	
012	Reactor Protection System / 7	A2.05	Faulty or erratic operation of detectors and function generators	
029	Containment Purge System (CPS) / 8	A1.02	Radiation levels	
033	Spent Fuel Pool Cooling System (SFPCS) / 8	A1.02	Radiation monitoring systems	
035	Steam Generator System (S/GS) / 4	K5.01	Effect of secondary parameters, pressure, and temperature on reactivity	
039	Main and Reheat Steam System (MRSS) / 4	K1.04	RCS temperature monitoring and control	
039	Main and Reheat Steam System (MRSS) / 4	2.1.32	Ability to explain and apply all system limits and precautions.	Was 039 2.4.6 replaced with 039 2.1.32 since there are no EOP associated with this system (poker chip method)
073	Process Radiation Monitoring (PRM) System / 7	K3.01	Radioactive effluent releases	
075	Circulating Water System / 8	A4.01	Emergency/essential SWS pumps	

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Plant Systems - Tier 2 / Group 2

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Sys/Ev #	System / Evolution Name	KA	KA Topic	Comment
079	Station Air System (SAS) / 8	K4.01	Cross-connect with IAS	
079	Station Air System (SAS) / 8	A2.01	Cross-connection with IAS	
086	Fire Protection System (FPS) / 8	K1.02	Raw service water	
086	Fire Protection System (FPS) / 8	A3.01	Starting mechanisms of fire water pumps	
103	Containment System / 5	K3.01	Loss of containment integrity under shutdown conditions	

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Plant Systems - Tier 2 / Group 3

Form ES-401-3

Sys/Ev #	System / Evolution Name	KA	KA Topic	Comment
005	Residual Heat Removal System (RHRS) / 4	K6.03	RHR heat exchanger	
041	Steam Dump System (SDS) and Turbine Bypass Control / 4	A3.03	Steam flow	
041	Steam Dump System (SDS) and Turbine Bypass Control / 4	2.4.31	Knowledge of annunciators alarms and indications, and use of the response instructions.	Was 041 2.4.49 replaced with 041 2.4.31 since there are no immediate actions associated with this system (poker chip method)
076	Service Water System (SWS) / 4	K2.01	Service water	

Generic Knowledge (Abilities Outline (Tier 3)

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Form ES-401-5

Facility: R.E. Ginna Nuclear Power Plant

Generic Category	KA	KA Topic	Comment
Conduct of Operations	2.1.6	Ability to supervise and assume a management role during plant transients and upset conditions.	
	2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.	
	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	
	2.1.34	Ability to maintain primary and secondary plant chemistry within allowable limits.	
			Category Total: 4
Equipment Control	2.2.23	Ability to track limiting conditions for operations.	
	2.2.26	Knowledge of refueling administrative requirements.	
	2.2.32	Knowledge of the effects of alterations on core configuration.	
	2.2.33	Knowledge of control rod programming.	
	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity.	
			Category Total: 5
Radiation Control	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	
	2.3.11	Ability to control radiation releases.	
			Category Total: 4

Generic Knowledge(Abilities Outline (Tier 3)

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Form ES-401-5

Facility: R.E. Ginna Nuclear Power Plant

Generic Category	KA	KA Topic	Comment
Emergency Procedures/Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps.	
	2.4.7	Knowledge of event based EOP mitigation strategies.	
	2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.	
	2.4.48	Ability to interpret control room indications to verify the status and operation of system, and understand how operator actions and directives affect plant and system conditions.	

Category Total: 4

Generic Total: 17

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Form ES-401-4

Exam Date: 02/08/2002Exam Level: RO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	3	3	2				3	3			2	16
	2	3	4	5				3	1			1	17
	3	0	1	0				1	1			0	3
	Totals Tier	6	8	7				7	5			3	36
2. Plant Systems	1	2	2	2	2	2	2	2	2	2	2	3	23
	2	2	2	2	2	2	2	2	2	1	2	1	20
	3	1	1	1	1	0	1	1	0	1	1	0	8
	Tier Totals	5	5	5	5	4	5	5	4	4	5	4	51
3. Generic Knowledge And Abilities					Cat 1		Cat 2		Cat 3		Cat 4		
					3		3		3		4		13

Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each

2. Actual point totals must match those specified in the table.

3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless

4. Systems/evolutions within each group are identified on the associated outline.

5. The shaded areas are not applicable to the category /tier.

6. The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be

7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be

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Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-4

E/APE #	E/APE Name / Safety Function	KA	KA Topic	Comment
015	Reactor Coolant Pump (RCP) Malfunctions / 4	AK2.07	RCP seals	
026	Loss of Component Cooling Water (CCW) / 8	AA2.04	The normal values and upper limits for the temperatures of the components cooled by CCW	
027	Pressurizer Pressure Control (PZR PCS) Malfunction / 3	AK2.03	Controllers and positioners	
040	Steam Line Rupture / 4	AA1.01	Manual and automatic ESFAS initiation	
040	Steam Line Rupture / 4	AA2.03	Difference between steam line rupture and LOCA	
057	Loss of Vital AC Electrical Instrument Bus / 6	AA1.01	Manual inverter swapping	
067	Plant Fire on Site / 9	AA2.10	Time limit of long-term-breathing air system for control room	
068	Control Room Evacuation / 8	AK3.02	System response to turbine trip	
068	Control Room Evacuation / 8	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	
069	Loss of Containment Integrity / 5	AK3.01	Guidance contained in EOP for loss of containment integrity	
069	Loss of Containment Integrity / 5	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	

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Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

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E/APE #	E/APE Name / Safety Function	KA	KA Topic	Comment
E07	Saturated Core Cooling / 4	EK1.3	Annunciators and conditions indicating signals, and remedial actions associated with the Saturated Core Cooling	
E08	Pressurized Thermal Shock / 4	EA1.1	Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	
E09	Natural Circulation Operations / 4	EK1.1	Components, capacity, and function of emergency systems	Very similar to E09 EK2.1
E09	Natural Circulation Operations / 4	EK2.1	Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	Very similar to E09 EK1.2
E14	High Containment Pressure / 5	EK1.2	Normal, abnormal and emergency operating procedures associated with High Containment Pressure	

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Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-4

E/APE #	E/APE Name / Safety Function	KA	KA Topic	Comment
001	Continuous Rod Withdrawal / 1	AK3.02 3.01	Tech-Spec limits on rod operability	Changed to 3.01 no question for 3.02
003	Dropped Control Rod / 1	AK2.05	Control rod drive power supplies and logic circuits	
007	Reactor Trip / 1	EK2.02	Breakers, relays and disconnects	
008	Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open) / 3	2.1.30	Ability to locate and operate components, including local controls.	
009	Small Break LOCA / 3	EK1.01	Natural circulation and cooling, including reflux boiling	
009	Small Break LOCA / 3	EK2.03	S/Gs	
011	Large Break LOCA / 3	EK2.02	Pumps	
029	Anticipated Transient Without Scram (ATWS) / 1	EA2.05	System component valve position indications	
033	Loss of Intermediate Range Nuclear Instrumentation / 7	AA1.03	Manual restoration of power	
037	Steam Generator (S/G) Tube Leak / 3	AK3.08	Criteria for securing RCP	

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Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

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E/APE #	E/APE Name / Safety Function	KA	KA Topic	Comment
038	Steam Generator Tube Rupture (SGTR) / 3	EK1.04	Reflux boiling	
E01	Rediagnosis / 3	EK1.1	Components, capacity, and function of emergency systems	
E02	SI Termination / 3	EK3.1	Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics	Very similar to E02 EA1.2
E02	SI Termination / 3	EA1.2	Operating behavior characteristics of the facility	Very similar to E02 EK3.1
E11	Loss of Emergency Coolant Recirculation / 4	EK3.3	Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations	
E16	High Containment Radiation / 9	EK3.2	Normal, abnormal and emergency operating procedures associated with High Containment Radiation	
E16	High Containment Radiation / 9	EA1.1	Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	

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Emergency and Abnormal Plant Evolutions - Tier 1 / Group 3

Form ES-401-4

E/APE #	E/APE Name / Safety Function	KA	KA Topic	Comment
028	Pressurizer (PZR) Level Control Malfunction / 2	AK2.03	Controllers and positioners	
065	Loss of Instrument Air / 8	AA1.02	Components served by instrument air to minimize drain on system	
E15	Containment Flooding / 5	EA2.2	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	

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Plant Systems - Tier 2 / Group 1

Form ES-401-4

Sys/Ev #	System / Evolution Name	KA	KA Topic	Comment
001	Control Rod Drive System / 1	K1.04	RCS	
001	Control Rod Drive System / 1	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	
003	Reactor Coolant Pump System (RCPS) / 4	K3.04	RPS	
003	Reactor Coolant Pump System (RCPS) / 4	A1.05	RCS flow	
004	Chemical and Volume Control System (CVCS) / 1	K5.14	Reduction process of gas concentration in RCS: vent-accumulated non-condensable gases from PZR bubble space, depressurized during cooldown or by alternately heating and cooling (spray) within allowed pressure band (drive more gas out of solution)	
004	Chemical and Volume Control System (CVCS) / 1	A1.05	S/G pressure and level	
013	Engineered Safety Features Actuation System (ESFAS) / 2	K2.01	ESFAS/safeguards equipment control	
013	Engineered Safety Features Actuation System (ESFAS) / 2	K6.01	Sensors and detectors	
015	Nuclear Instrumentation System / 7	2.1.14	Knowledge of system status criteria which require the notification of plant personnel.	
017	In-Core Temperature Monitor (ITM) System / 7	A2.01	Thermocouple open and short circuits	
017	In-Core Temperature Monitor (ITM) System / 7	A4.01	Actual in-core temperatures	

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Plant Systems - Tier 2 / Group 1

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Sys/Ev #	System / Evolution Name	KA	KA Topic	Comment
022	Containment Cooling System (CCS) / 5	A4.04	Valves in the CCS	
022	Containment Cooling System (CCS) / 5	K3.01	Containment equipment subject to damage by high or low temperature, humidity, and pressure	
059	Main Feedwater (MFW) System / 4	K4.16	Automatic trips for MFW pumps	
059	Main Feedwater (MFW) System / 4	A2.05	Rupture in MFW suction or discharge line	
061	Auxiliary / Emergency Feedwater (AFW) System / 4	K2.01	AFW system MOVs	
061	Auxiliary / Emergency Feedwater (AFW) System / 4	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	
068	Liquid Radwaste System (LRS) / 9	A3.02	Automatic isolation	
068	Liquid Radwaste System (LRS) / 9	K6.10	Radiation monitors	
071	Waste Gas Disposal System (WGDS) / 9	K1.05	Meteorological tower	
071	Waste Gas Disposal System (WGDS) / 9	K4.06	Sampling and monitoring of waste gas release tanks	
072	Area Radiation Monitoring (ARM) System / 7	K5.02	Radiation intensity changes with source distance	
072	Area Radiation Monitoring (ARM) System / 7	A3.01	Changes in ventilation alignment	

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Plant Systems - Tier 2 / Group 2

Form ES-401-4

Sys/Ev #	System / Evolution Name	KA	KA Topic	Comment
002	Reactor Coolant System (RCS) / 2	K5.09	Relationship of pressure and temperature for water at saturation and subcooling conditions	
002	Reactor Coolant System (RCS) / 2	K6.03	Reactor vessel level indication	
010	Pressurizer Pressure Control System (PZR PCS) / 3	K2.01	PZR heaters	
011	Pressurizer Level Control System (PZR LCS) / 2	A4.04	Transfer of PZR LCS from automatic to manual control	
011	Pressurizer Level Control System (PZR LCS) / 2	K6.05	Function of PZR level gauges as postaccident monitors	
012	Reactor Protection System / 7	A2.05	Faulty or erratic operation of detectors and function generators	
014	Rod Position Indication System (RPIS) / 1	K3.02	Plant computer	
026	Containment Spray System (CSS) / 5	K4.05	Prevention of material from clogging nozzles during recirculation	
029	Containment Purge System (CPS) / 8	A1.02	Radiation levels	
033	Spent Fuel Pool Cooling System (SFPCS) / 8	A1.02	Radiation monitoring systems	
035	Steam Generator System (S/GS) / 4	K5.01	Effect of secondary parameters, pressure, and temperature on reactivity	
039	Main and Reheat Steam System (MRSS) / 4	K1.04	RCS temperature monitoring and control	

Facility: R.E. Ginna Nuclear Power Plant

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-4

Sys/Ev #	System / Evolution Name	KA	KA Topic	Comment
063	D.C. Electrical Distribution System / 6	K2.01	Major DC loads	
063	D.C. Electrical Distribution System / 6	2.1.32	Ability to explain and apply all system limits and precautions.	
073	Process Radiation Monitoring (PRM) System / 7	K3.01	Radioactive effluent releases	
075	Circulating Water System / 8	A4.01	Emergency/essential SWS pumps	
079	Station Air System (SAS) / 8	K4.01	Cross-connect with IAS	
079	Station Air System (SAS) / 8	A2.01	Cross-connection with IAS	
086	Fire Protection System (FPS) / 8	K1.02	Raw service water	
086	Fire Protection System (FPS) / 8	A3.01	Starting mechanisms of fire water pumps	

Facility: R.E. Ginna Nuclear Power Plant

ES - 401

Plant Systems - Tier 2 / Group 3

Form ES-401-4

Sys/Ev #	System / Evolution Name	KA	KA Topic	Comment
005	Residual Heat Removal System (RHRS) / 4	K6.03	RHR heat exchanger	
007	Pressurizer Relief Tank/Quench Tank System (PRTS) / 5	A4.01	PRT spray supply valve	
007	Pressurizer Relief Tank/Quench Tank System (PRTS) / 5	A1.02	Maintaining quench tank pressure	
041	Steam Dump System (SDS) and Turbine Bypass Control / 4	A3.03	Steam flow	
041	Steam Dump System (SDS) and Turbine Bypass Control / 4	K4.18	Turbine trip	
076	Service Water System (SWS) / 4	K2.01	Service water	
076	Service Water System (SWS) / 4	K1.16	ESF	
103	Containment System / 5	K3.01	Loss of containment integrity under shutdown conditions	

PWR RO Examination Outline

Form ES-401-5

Facility: R.E. Ginna Nuclear Power Plant

Generic Category	KA	KA Topic	Comment
Conduct of Operations	2.1.9	Ability to direct personnel activities inside the control room.	
	2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.	
	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	
Category Total:			3
Equipment Control	2.2.23	Ability to track limiting conditions for operations.	
	2.2.30	Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communication with fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.	
	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity.	
Category Total:			3
Radiation Control	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	
	2.3.2	Knowledge of facility ALARA program.	
	2.3.11	Ability to control radiation releases.	
Category Total:			3

Generic Knowledge & Abilities Outline (Tier 3)

Printed: 10/05/200

PWR RO Examination Outline**Form ES-401-5****Facility:** R.E. Ginna Nuclear Power Plant

Generic Category	KA	KA Topic	Comment
Emergency Procedures/Plan	2.4.10	Knowledge of annunciator response procedures.	
	2.4.17	Knowledge of EOP terms and definitions.	
	2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.	
	2.4.29	Knowledge of the emergency plan.	

Category Total: 4**Generic Total: 13**

Facility: Ginna
Exam Level (circle one) RO / SRO(I) / SRO(U)

Date of Examination: Feb 11, 2002
Operating Test No.: 02-01

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. 001 Control Rod Drive System J001.001 Perform Rod Exercises Per PT-1	D, A, S	1
b. 004 Chemical and Volume Control System J004.011 Place Excess Letdown in Service	D, S	2
c. 005 Residual Heat Removal System (PRI) J005.005 Line Up RCDT Pump For Core Cooling	M, A, S, L	4
d. 061 Auxiliary/Emergency Feedwater System (SEC) (ESF) J061.001 Place the Standby AFW System in Service	D, S, L	4
e. 062 AC Electrical Distribution J062.024 Transfer 1A Inst. Bus to Maintenance Power	D, S	6
f. 012 Reactor Protection System J012.003 Defeat Failed RCS Temperature Channel	D, S	7
g. 006 Emergency Core Cooling System J006.006 Transfer ECCS to Cold Leg Recirculation	M, A, S, L	3

B.2 Facility Walk-Through

a. 004 Chemical and Volume Control System J004.009 Take Local Manual Control or Charging Pump	D, R	2
b. 064 Emergency Diesel Generators (ESF) J064.004 Start "A" EDG Locally Per ER-FIRE.1	M, A, L	6
c. 086 Fire Protection System J086.001 Reconnect Fire System	D, C	8

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

Facility: GinnaDate of Examination: Feb 11, 2002Exam Level (circle one): RO / SRO(I) / SRO(U)Operating Test No.: 02-01**B.1 Control Room Systems**

System / JPM Title	Type Code*	Safety Function
a. 005 Residual Heat Removal System (PRI) J005.005 Line Up RCDT Pump For Core Cooling	M, A, S, L	4
b. 061 Auxiliary/Emergency Feedwater System (SEC) (ESF) J061.001 Place the Standby AFW System in Service	D, S, L	4
c. 012 Reactor Protection System J012.003 Defeat Failed RCS Temperature Channel	D, S	7
d.		
e.		
f.		
g.		

B.2 Facility Walk-Through

a. 004 Chemical and Volume Control System J004.009 Take Local Manual Control or Charging Pump	D, R	2
b. 064 Emergency Diesel Generators (ESF) J064.004 Start "A" EDG Locally Per ER-FIRE.1	M, A, L	6
c.		

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

Facility: <u>Ginna</u>		Date of Examination: <u>Feb 11, 2002</u>
Examination Level (circle one): <u>(RO) SRO</u>		Operating Test Number: <u>02-01</u>
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations	JPM: J017.001 Determine RCS Core Exit Subcooling With the PPCS Out of Service K/A 2.1.7 Importance 3.7
		Not Applicable
	Conduct of Operations	JPM: J017.001 O-6.13 Daily Performance Logs K/A 2.1.18 Importance 2.9
		Not Applicable
A.2	Equipment Control	JPM: J343.004 A-52.12, Inoperability of Equipment K/A 2.2.24 Importance 2.6
		Not Applicable
A.3	Radiation Monitoring/Control	Question: Knowledge of Work Stoppage Based on In-Progress ALARA Review K/A 2.3.10 Importance 2.9
		Question: Knowledge of Immediate Notification for Radiation Incidents K/A 2.3.1 Importance 2.6
A.4	Emergency Procedures/Plan	JPM: J085.002 Complete NY State Radiological Emergency Data Form Part I (EPIP 1-5, Att 3A) K/A 2.4.39 Importance 3.3
		Not Applicable

Facility: <u>Ginna</u>		Date of Examination: <u>Feb 11, 2002</u>
Examination Level (circle one): RO / <u>SRO</u>		Operating Test Number: <u>02-01</u>
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations	JPM: J001.010 Estimated Critical Rod Position Determination K/A 2.1.23 Importance 4.0
		Not Applicable
	Conduct of Operations	JPM: J017.001 Determine RCS Core Exit Subcooling With the PPCS Out of Service K/A 2.1.7 Importance 4.4
		Not Applicable
A.2	Equipment Control	JPM: Verify Equipment Tagout Boundary K/A 2.2.13 Importance 3.8
		Not Applicable
A.3	Radiation Monitoring/ Control	JPM: Approve Liquid Waste Release Form (Inoperable Effluent Monitor) K/A 2.3.6 Importance 3.1
		Not Applicable
A.4	Emergency Procedures/ Plan	JPM: Perform Event Classification K/A 2.4.41 Importance 4.1
		Not Applicable

Facility: Ginna Scenario No.: 1Op-Test No.: 01-01Examiners: Laughlin (Bissett)

Operators: _____

FishSilk

Initial Conditions: Plant is at ~48% reactor power, MOL. $C_B = 824$ ppm. Power was reduced 4 hours ago for condenser tube leakage and is ready to go back to full power. BAST $C_B = 11,000$ ppm. "B" MDAFW pump and "C" charging pump are OOS.

Turnover: Plant is at ~48% reactor power, MOL. $C_B = 824$ ppm. Power was reduced 4 hrs ago for condenser tube leakage and is ready to go back to full power. BAST $C_B = 11,000$ ppm. "C" charging pump is OOS for excessive leakage, "B" MDAFW pump is OOS for check valve repair.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N(CRF) R(HCO)	Raise power to 100% IAW O-1.2. .
2	NIS07A	I(CRF, HCO)	PR channel N41 fails high, rods insert. (Enter ER-NIS.3, TS entry)
3	ROD2A	C(CRF, HCO)	Dropped control rod 2A ^{C-7} (Enter AP-RCC.2 for RCC malfunction, O-5.1 for load reduction) _{1162 500}
4	CND07 A	C(All)	Loss of condenser vacuum-east 1B, results in turbine/Rx trip. (Enter AP-TURB.4 and E0)
5	EDS01 A&B	M(All)	Loss of offsite power. (Enter AP-ELEC.4) "A" EDG runs on bus 14.
6	GEN04 B	C(All)	"A" EDG runs on bus 14, "B" EDG fails to auto-start but can be started manually.
7	GEN04 A	M(All)	"A" EDG trips, station blackout. (Enter ECA-0.0) Terminate when transition to ECA-0.1

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

HBO

CO

RO-1

RO-2

Op-Test No.: _____ Scenario No.: 1 Event No.: 1Page 1 of 6Event Description: Raise reactor power to 100% IAW)-1.2

Time	Position	Applicant's Actions or Behavior
	CRF	Direct start of "B" MFW pump per attachment "MFW Pump B"
	<i>MFW PPB ATTACH</i>	(Steps 7.0- 13.0) <i>STEP 5.8.12</i>
	CO	Lineup Service Water to MFW pump B oil cooler
		Take B MFW out of Pull Stop
		Verify MFW pump recirculation valve opens (AOV-4148)
		Start "B" MFW pump
		Verify MFW pump discharge pressure and open discharge valve
		MOV-3976
	CRF	Direct AO to close B MFW pump discharge bypass valve
	<i>and ATTACH</i>	MOV-3976A
	CO	Place HDT Level Controller LC-2013A in Auto
	CRF	Direct AO to check MFW pump warmup valves closed
	HCO	Check Delta I cumulative time on PPCS
		Verify QPTR is <1.02
	CRF	Verify RP has a leak rate determined from the air ejector sample
	CO	Raise valve position limit to 100%
		Raise Setter and start load increase
	HCO	Manually operate control rods/dilute as necessary to control Tave
		<i>↑ power 10%/hr, rods in Manual</i>

Op-Test No.: _____ Scenario No.: 1 Event No.: 2Page 2 of 6Event Description: PR Channel N41 Fails High

Time	Position	Applicant's Actions or Behavior
	All	Identify failed PR channel
	HCO	Place rod control bank selector switch in manual
	HCO/CO	Adjust Tave/ Tref as necessary
	CRF	Address Technical Specifications (ITS3.2.3)
		Direct NIS channel 41 to be defeated per "Attachment N-41 Defeat"
	HCO	Verify rod control bank selector switch in manual
	HCO/CO	Place DROPPED ROD MODE switch to bypass and verify
		following alarms - DROPPED ROD BYPASS is lit;
		POWER RANGE ROD DROP BYPASS is lit;
		Annunciator E-7 NIS TRIP BYPASS is lit
		Place T/405E DELTA T DEFEAT switch to LOOP A UNIT 1
		Place OVERTEMP TRIP bistable switch to DEFEAT and verify
		the following - F-23 RCS OT^ T CHANNEL ALERT is lit
		Red bistable status light OT^ T LOOP A TC405C is lit
		Place OVERPOWER TRIP B/S switch to DEFEAT and verify the
		following: F-32 RCS OP^ T CHANNEL ALERT is lit
		Red B/S status light OP^ T LOOP A TC405A is lit
		Place UPPER SECTION DEFEAT switch to the PRN41 position &
		verify the following: Local light for CHANNEL DEFEAT is lit
		Place LOWER SECTION DEFEAT switch to the PRN41 position &
		verify the following: Local light for CHANNEL DEFEAT is lit
		Place POWER MISMATCH BYPASS switch to BYPASS PRN41
		Place ROD STOP BYPASS switch to BYPASS PRN41
		Place COMPARATOR CHANNEL DEFEAT switch to N41 & verify
		the following: COMPARATOR DEFEAT light is lit

Op-Test No.: _____ Scenario No.: _1_ Event No.: _2 (con't)___

Page _3_ of _6_

Event Description: _PRN41 Failure_

Time	Position	Applicant's Actions or Behavior
	HCO/CO	Remove 118V 5A AC INSTR POWER fuses & verify the following
		E-18 POWER RANGE LOSS OF DETECTOR VOLTAGE
		E-19 POWER RANGE HI RANGE CHANNEL ALERT 108%
		E-21 POWER RANGE OVERPOWER ROD STOP 103%
		E-27 POWER RANGE LO RANGE CHANNEL ALERT 24%
		E-28 POWER RANGE ROD DROP ROD STOP 5%/5 SEC
		Verify the following red bistable lights (MCB) are lit
		HI POW RANGE P-10 NC41M
		HI POW RANGE P-8 NC41N
		LO POW RANGE TRIP NC41P
		HI POW RANGE TRIP NC41R
		HI POW RANGE P-9 NC41S
		Verify various status light on PR N41A drawer are lit
		Verify following status lights on PRN41B drawer are extinguished
		INSTRUMENT POWER ON
		CHANNEL ON TEST
	CRF	Notify I&C to install jumpers
	HCO/CO	Restore ROD CONTROL back to AUTO
		Reset dropped rod rod stop signals at PR NIS drawers
	CRF	Check Tech Specs
		Notify Operations supervision I&C and Reactor Engineering

Page 4 of 6

Event Description: Dropped Control Rod 2A (Enter AP-RCC.2 for RCC malfunction, O-5.1 for load reduction) Annunciator C-5 Rod Deviation light lit, Annunciator F-29 PPCS or QUADRANT POWER TILT lit.

[illegible]

Op-Test No.: _____ Scenario No.: 1 Event No.: 4Page 5 of 6

Event Description: Loss of condenser vacuum- east 1B resulting in a turbine/Rx trip

Time	Position	Applicant's Actions or Behavior
	CO	Identifies decreasing vacuum, monitors condenser indications
	CRF	Directs entry into AP-TURB.4 LOSS OF CONDENSER VACUUM
		Dispatches AO to perform local actions
	CRF	Directs Rx Trip and entry into E-0
	HCO/CO	Performs Immediate Actions of E-0
		Verify Rx Trip
		Verify Turbine Stop Valves Shut
		Verify Both Trains of AC Emergency Buses Energized
		Check if SI is Actuated
		SI NOT Required - Transition to ES 0.1 Reactor Trip Response
		Monitor RCS Tave
		Check S/G Feed Flow Status
		Verify all rods on bottom
	<i>CVE:</i>	<i>Needed for LOOP</i>
		Verify All AC Buses ENERGIZED BY OFFSITE POWER - NO
		Perform RNO actions of step 4 of ES-0.1
		Verify at Least Two SW Pumps running - NO
		Start one SW pump per RNO step 5
		Verify IA Available
		Check PZR Level Control - start charging pump(s) per RNO step 7
	<i>CVE:</i>	"A" D/G trips - Loss of all AC
	CRF	Directs transition to ECA-0.0 Loss of all AC

Appendix D

Operator Actions

Form ES-D-2

Op-Test No.: _____ Scenario No.: 1 Event No.: 5,6,7 Page 6 of 6Event Description: Loss of all AC _____

Time	Position	Applicant's Actions or Behavior
	CRF	Directs immediate actions of ECA-0.0
	CO	Close MSIVs
	HCO	Isolate RCS by closing AOV 200A, B, C, AOV 371, 427 & AOV 310
	CO	Verify adequate TDAFW flow >200 gpm
		Try to restart a D/G
	CRF	Direct AO to locally restart a D/G
	HCO/CO	Pull Stop Equipment
		Isolate RCP seal injection
		Place hotwell level control in manual at 50%
		Check S/G status - intact
	CRF	Direct manual start of "B" D/G <i>Picked up Buses 16+17</i>
	CO	Manually control ARV to stabilize RCS temp
		Restore SW pumps
		Verify equipment loaded on available AC emergency buses
	CRF	Direct AO to check battery chargers
		Direct transition to ECA-0.1
	CRF	Site Area Classification

Facility: Ginna Scenario No.: 01-02 Op-Test No.: _____

Examiners: Bissett Operators: _____
Fish _____
Laughlin _____

Initial Conditions: Plant is at 100% power, BOL, C_B 1329, xenon equilibrium. PORV-430 isolated due to high leakage. MOV-516 closed. BAST C_B - 11,000 ppm.

Turnover: _____

Event No.	Malf. No.	Event Type*	Event Description
1	PZR01 A	C(CRF, HCO)	PZR spray valve PCV-431A fails open approx 50%. (Enter AP-PRZR.1)
2	NIS8A	I (CRF, HCO)	Blown fuse on intermediate range A channel 35. (Enter ER-NIS.2) <i>PZR level 428 fail low</i>
3	TUR05 C	C(CRF) R(HCO)	Turbine vibration increases. (Enter AP-TURB.3, requires load reduction to stabilize vibration)
4	SGN04 A	M(All)	SGTR on S/G 1A at 700 gpm. (Enter E-0, E-3, O-6-10) <i>SGTR 46 tube leak 450</i> <i>AP-SG.1</i>
5	TUR02 TUR11 D	C(CRF, CO)	Turbine fails to trip. (Manually trip turbine per E-0)
6	SIS03B	C(CRF, HCO)	1B SI pump fails to start.
7	PZR05 B	C(CRF, HCO)	PORV 431 fails open, resulting in SBLOCA. (Enter ECA-3.1, AP-PRZR.1, AP-RCS.1) Terminate when RCS cool-down is underway.
8			<i>SGTR S/G 1A (Enter E-3)</i>

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

Page 1 of 7

Event Description: Pzr spray valve PCV-431A fails open (~50%)

[illegible]

Op-Test No.: _____ Scenario No.: 2 Event No.: 2

Page 2 of 7

Event Description: Blown fuse on intermediate range A channel 35

[illegible]

Op-Test No.: _____ Scenario No.: 1 Event No.: 5,6Page 5 of 7

Event Description: Rx Trip, turbine fails to trip, 1B SI pump fails to start

Time	Position	Applicant's Actions or Behavior
	CRF	Direct actions of E-0
	HCO/CO	Verify Rx Trip
		Verify turbine stop valves closed- NO- MANUALLY TRIP TURBINE
		Verify AC Emergency Busses Energized
		Check if SI Actuated
		Verify SI/RHR pumps running -NO-MANUALLY START B SI PUMP
		Verify CNMT RECIRC FANS running
		Verify CNMT Spray NOT required
		Check if Main Steamlines should be isolated
		Verify MFW Isolation
		Verify AFW Pumps Running
		Verify at least Two SW Pumps running
		Verify CI and CVI
		Check CCW System Status
		Verify SI and RHR Pump Flow
		Verify AFW Flow > 200 GPM
		Verify AFW Valve Alignment
		Verify SI Pump and RHR Pump Emergency Alignment
		Check CCW Flow to RCP Thermal Barriers
		Check PZR PORVs and Spray Valves
		Monitor RCP Trip Criteria
		Check if S/G Secondary Side is Intact
		Check if S/G Tubes are Intact - NO- Transition to E-3

Op-Test No.: _____ Scenario No.: 2 Event No.: 7Page 6 of 7Event Description: Steam Generator Tube Rupture

Time	Position	Applicant's Actions or Behavior
	CRF	Direct actions of E-3 Steam Generator Tube Rupture
	HCO/CO	Monitor RCP Trip Criteria
		Identify Ruptured S/G- 1A S/G
		Isolate Flow From Ruptured 1A S/G
		Complete Ruptured S/G Isolation
		Check Ruptured S/G Level
		Verify Ruptured S/G Isolated
		Establish Condenser Steam Dump Pressure Control
		Reset SI
		Initiate RCS Cooldown
		Monitor Intact S/G Levels
		Check PZR PORVs and Block Valves
		Reset CI
		Monitor AC Busses - Energized by Offsite Power
		Verify SW Flow
		Establish IA to CTMT - AOV 5392 FAILS to OPEN
		Check if RHR Pumps should be stopped <i>place OFF-AUTO</i>
		Establish Charging Flow
		Check if RCS Cooldown Should be Stopped
		Depressurize RCS to minimize break Flow and Refill Pzr via PORV
		Check RCS Pressure INCREASING - NO - TRANSITION TO
		ECA-3.1
		<i>Detach N₂ PORVs to operate PORV Attach 12 N₂ PORVs</i>
		<i>Will close Block Valve</i>

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[illegible]

Facility: Ginna Scenario No.: 01-03 Op-Test No.: _____

Examiners: Bissett Operators: _____
Fish _____
Laughlin _____

Initial Conditions: The plant is at 100% power BOL xenon equilibrium. Boron=1329ppm, BAST conc. = 11,000. Circuit 751 is OOS due to an auto accident, "D" SW pump is OOS due to motor failure.

Turnover: _____

Event No.	Malf. No.	Event Type*	Event Description
1	PZR2D	I(CRF, HCO)	PZR pressure channel PT-449 fails high. (Enter AP-PRZR.1, ER-INST.1 to defeat channel)
2	RCS14 B	C(CRF, HCO)	"B" RCP #3 seal failure. (Enter AP-RCP.1)
3	RCS2A	C(CRF, HCO)	RCS leak inside containment from loop A hot leg, 15 gpm. (Enter AP-RCS.1) <i>(Notify CUE to Start Shutdown)</i>
4	N/A	N(CRF) R(HCO)	Perform plant shutdown in response to RCS leak. (Enter O-2.1, 100% to 95%) <i>(AP-TURB.5)</i>
5	CND8	C(CRF, CO)	Condensate header break 20K gpm, complete loss of main feedwater. (Enter E-0, E-1) <i>(AP-FW.1)</i>
6	RPS5A & B	M(All)	ATWS (Enter FR-S.1)
7	TUR2	C(CRF, CO)	Main turbine fails to automatically trip. <i>Loss of Reactor or Secondary Coolant (E-1) due to</i>
8	EVC15	C(CRF, HCO)	BA flow transmitter, ET110 fails to selected value won't allow boron addition. (Enter ER-EVCS.1) <i>RCS Load</i>
			Terminate drill when SI termination criteria met in E-1.
9			<i>Low CST level, ER-AFW.1 (if needed)</i>

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

Op-Test No.: _____ Scenario No.: 3 Event No.: 1Page 1 of 8Event Description: PZR pressure channel failure PT-449 fails HI

Time	Position	Applicant's Actions or Behavior
	CRF	PT-449 fails HI, Directs entry into AP-PZR.1 Abnormal PZR PRESS
	HCO/CO	Acknowledges ANN-2 and F-10 F-10
		Checks PZR Press - Refers to ER-INST.1
	<i>Sect 4.4</i>	Place 431K in MANUAL @ ~50%
		Refer to Attachment PZR PRESSURE PI-449 YELLOW CHANNEL
		to defeat failed channel
		Place P/429A to DEFEAT-1 (PLP PZR PRESS/LVL RACK)
		Place T/405F DELTA T DEFEAT switch to LOOP B UNIT 2
		(RIL INSERTION LIMIT Rack)
		In Y-1 PROTECTION CHANNEL 4 rack Place B/S switches
		To DEFEAT F-27, F-23
		408 LOOP B-2 - OVER TEMP TRIP
		449 CHANNEL 4 - LOW PRESS TRIP
		Place PZR pressure recorder to position 1-3 (MCB)
		Delete 404/408 from the PPCS 2 bistables list
		Restore PZR Pressure Control to automatic
	CRF	Refer to ITS for applicable LCOs
		Section 3.3.1 Table 3.3.1-1 Functions 5 and 7a
		Section 3.3.3 Table 3.3.3-1 Functions 1 and 6
		Check TRM 3.4.3 ATWS mitigation
		Notify maintenance and higher supervision

Op-Test No.: _____ Scenario No 3 Event No.: 2

Page 2 of 8

Event Description: _"B" RCP #3 seal failure

[illegible]

Op-Test No.: _____ Scenario No.: 3 Event No.: 3Page 3 of 8Event Description: RCS leak inside CTMT from A loop hot leg15 gpm

Time	Position	Applicant's Actions or Behavior
	CRF	Directs actions of AP-RCS.1 REACTOR COOLANT LEAK
	HCO/CO	Acknowledges ANN F-14, A-2, E-16, F-4
		Check PZR level (Decreasing) RNO actions
		Start additional charging pumps
		Check VCT M/U System
		Check if RCS leakage in CTMT
		Dispatch AO to Aux Bldg
		Check for leak to CCW System
		Check CVCS Conditions
		Check AUX Bldg radiation levels - <i>normal</i>
		Check PRT Indications
		Check S/Gs for Leakage - <i>red normal</i>
		Check SI Accumulator levels
		Check RCP Seal Leakoff Flows
		Check RCDT Leak Rate
		Check Valve Leakoff Temps
		Establish Stable Plant Conditions
		Evaluate RCS Leakage <i>12 GPM leak</i>
		RNO - Commence Plant Shutdown at 1%/min
	CRF	Notify higher supervision

*R-104 + R-2 alarms**C-18 CAN pump A auto start*

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[illegible]

Page 5 of 8

[illegible]

Op-Test No.: _____ Scenario No.: 3 Event No.: 6Page 6 of 8Event Description: ATWS and Failure of Main Turbine to Trip

Time	Position	Applicant's Actions or Behavior
	CRF	Direct actions of E-0
	HCO/CO	Verify Rx Trip - NO
		Manually trip the reactor - NO -
	CRF	Transition to FR-S.1
	HCO/CO	Verify Rx Trip - NO
		RNO- Manually trip reactor
		Manually insert rods
		Verify Turbine Stop Valves closed - NO
		Manually trip turbine
		Verify AFW flow
		Initiate Emergency Boration
		Check PZR PORV status - NO
		Open PORVs as necessary to control pressure
		Verify CTMT ventilation isolation ^{2?}
	CRF	Dispatch AO to locally trip reactor - YES
		Transition to E-0
		Direct actions of E-0
	HCO/CO	Verify Rx Trip
		Verify turbine stop valves closed
		Verify AC emergency busses
		Check if SI is actuated
		Verify SI and RHR pumps running
		Verify CTMT recirc fans running
		Verify CTMT spray not actuated

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Op-Test No.: _____ Scenario No.: 3 Event No.: 6 con'tPage 7 of 8Event Description: ATWS and Failure of Main Turbine to Trip

Time	Position	Applicant's Actions or Behavior
	HCO/CO	Check if any main steamline should be isolated
		Verify MFW isolation
		Verify AFW pumps running
		Verify CI and CVI
		Check CCW system status
		Verify SI and RHR flow
		Verify AFW flow > 200 gpm
		Verify SI pump and RHR pump emergency alignment
		Check CCW flow to RCP Thermal barriers
		Check if TDAFW pump can be stopped
		Monitor RCS Tave- stable or trending to 547 degrees
		Check PZR PORVs and Spray valves
		Monitor RCP Trip Criteria
		Check if S/G Secondary side is intact
		Check if S/G Tubes are intact
		Check if RCS is intact - NO
		Transition to E-1

Op-Test No.: _____ Scenario No.: 3 Event No.: _____Page 8 of 8

Event Description: Loss of Reactor or Secondary Coolant (E-1)

Time	Position	Applicant's Actions or Behavior
	CRF	Direct actions of E-1 <i>Have surrogate go to E-1, SI term. criteria</i>
	HCO/CO	Monitor RCP Trip Criteria
		Check if S/G secondary side intact
		Monitor intact S/G levels
		Monitor if secondary radiation levels are normal
		Monitor PRZ PORV status
		Reset SI and CI
		Verify adequate SW flow
		Establish IA to CTMT
		Check normal power to charging pumps
		Check if charging flow has been established
		Check if SI should be terminated
		Monitor if CTMT spray should be stopped
		Monitor if RHR pumps should be stopped
		Check RCS and S/G pressures
		Check if EDGs should be stopped
		Check if RHR should be throttled
		Verify CTMT sump recirculation capability
		Evaluate Plant Status
		NOTE: SHOULD MEET SI TERMINATION CRITERIA PER
		FOLDOUT PAGE CRITERIA OR STEP 12 OF E-1
	CRF	Transition to ES-1.1. SI TERMINATION
		Classify as a Site Area
		<i>May go to ER-AFW.1 for low CST level. - Note the possibility.</i>

*Write up actions just in case**< 5' in CST*