

Form 4.1-BWR Pressurized-Water Reactor Examination Outline

Facility: Grand Gulf																	Date of Exam:				
Tier	Group	RO K/A Category Points												SRO-Only Points							
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Total	A2	G	Total					
1. Emergency and Abnormal Plant Evolutions	1	3	4	4	N/A			3	3	N/A			3	20			7				
	2	1	1	1				1	1				1	6			3				
	Tier Totals	4	5	5				4	4				4	26			10				
2. Plant Systems	1	2	2	3	3	3	3	2	2	2	2	2	2	26			5				
	2	1	1	1	1	1	1	1	1	1	1	1	1	11			3				
	Tier Totals	3	3	4	4	4	4	3	3	3	3	3	3	37			8				
3. Generic Knowledge and Abilities Categories	CO			EC			RC		EM			6	CO	EC	RC	EM	7				
	2			2			1		1												
4. Theory	Reactor Theory					Thermodynamics					6										
	3					3															

Notes: CO = Conduct of Operations; EC = Equipment Control; RC = Radiation Control; EM = Emergency Procedures/Plan

- * These systems/evolutions may be eliminated from the sample when Revision 2 of the K/A catalog is used to develop the sample plan
- ** These systems/evolutions are only included as part of the sample (as applicable to the facility) when Revision 2 of the K/A catalog is used to develop the sample plan

Form 4.1-BWR			BWR Examination Outline					Page 2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
295001 (APE 1) Partial or Complete Loss of Forced Core Flow Circulation			X				Knowledge of the reasons for the following responses or actions as they apply to Partial or Complete Loss of Forced Core Flow Circulation: (CFR: 41.5 / 45.6) AK3.07 Recirculation pump discharge/suction valve manipulation	3.3	14
295003 (APE 3) Partial or Complete Loss of AC Power	X						Knowledge of the operational implications and/or cause and effect relationships of the following as they apply to Partial or Complete Loss of AC Power: (CFR: 41.8 to 41.10) AK1.01 Battery capacity	3.8	8
295004 (APE 4) Partial or Total Loss of DC Power				X			Ability to operate and/or monitor the following as they apply to Partial or Complete Loss of DC Power: (CFR: 41.7 / 45.6) AA1.03 AC electrical distribution	3.5	12
295005 (APE 5) Main Turbine Generator Trip			X				Knowledge of the reasons for the following responses or actions as they apply to Main Turbine Generator Trip: (CFR: 41.5 / 45.6) AK3.04 Main generator trip	3.2	15
295006 (APE 6) Scram						X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation (CFR: 41.5 / 43.5 / 45.12 / 45.13)	4.4	20
295016 (APE 16) Control Room Abandonment / 7						X	2.4.34 Knowledge of RO responsibilities outside the main control room during an emergency (CFR: 41.10 / 43.5 / 45.13)	4.2	10
295018 (APE 18) Partial or Complete Loss of CCW		X					Knowledge of the relationship between Partial or Complete Loss of Component Cooling Water and the following systems or components: (CFR: 41.7 / 45.8) AK2.05 RHR/LPCI	3.3	13
295019 (APE 19) Partial or Complete Loss of Instrument Air		X					Knowledge of the relationship between Partial or Complete Loss of Instrument Air and the following systems or components: (CFR: 41.7 / 45.8) AK2.23 Service water	2.7	2
295021 (APE 21) Loss of Shutdown Cooling					X		Ability to determine and/or interpret the following as they apply to Loss of Shutdown Cooling: (CFR: 41.10 / 43.5 / 45.13) AA2.02 RHR/shutdown cooling system flow	4.1	19
295023 (APE 23) Refueling Accidents			X				Knowledge of the reasons for the following responses or actions as they apply to Refueling Accidents: (CFR: 41.5 / 45.6) AK3.03 Ventilation isolation	3.7	1
295024 (EPE 1) High Drywell Pressure	X						Knowledge of the operational implications and/or cause and effect relationships of the following as they apply to High Drywell Pressure: (CFR: 41.8 to 41.10) EK1.02 Containment building integrity (Mark III)	4.0	9
295025 (EPE 2) High Reactor Pressure				X			Ability to operate and/or monitor the following as they apply to High Reactor Pressure: (CFR: 41.7 / 45.6) EA1.01 Main and reheat steam		11

295026 (EPE 3) Suppression Pool High Water Temperature			X				Knowledge of the reasons for the following responses or actions as they apply to Suppression Pool High Water Temperature: (CFR: 41.5 / 45.6) EK3.04 SLCS injection	3.6	17
295027 (EPE 4) High Containment Temperature (Mark III Containment Only)						X	2.4.3 Ability to identify post-accident instrumentation (CFR: 41.6 / 45.4)	3.7	7
295028 (EPE 5) High Drywell Temperature (Mark I and Mark II only)									16
295030 (EPE 7) Low Suppression Pool Water Level				X			Ability to operate and/or monitor the following as they apply to Low Suppression Pool Water Level: (CFR: 41.7 / 45.6) EA1.01 ECCSs	4.0	5
295031 (EPE 8) Reactor Low Water Level	X						Knowledge of the operational implications and/or cause and effect relationships of the following as they apply to Reactor Low Water Level: (CFR: 41.8 to 41.10) EK1.01 Adequate core cooling	4.7	6
295037 (EPE 14) Scram Condition Present and Reactor Power Above APRM Downscale or Unknown		X					Knowledge of the relationship between SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown and the following systems or components: (CFR: 41.7 41.8 / 45.8) EK2.12 RCIS (BWR 6)	3.7	18
295038 (EPE 15) High Offsite Radioactivity Release Rate					X		Ability to determine and/or interpret the following as they apply to High Offsite Radioactivity Release Rate: (CFR: 41.10 / 43.5 / 45.13) EA2.02 Total number of curies released or release rate/duration	3.2	3
600000 (APE 24) Plant Fire on Site		X					Knowledge of the relationship between Plant Fire on Site and the following systems or components: (CFR 41.7 / 45.7) AK2.07 Electrical distribution system	3.3	4
700000 (APE 25) Generator Voltage and Electric Grid Disturbances					X		Ability to determine and/or interpret the following as they apply to Generator Voltage and Electric Grid Disturbances: (CFR: 41.5 and 43.5 / 45.5 / 45.7 / 45.8) AA2.06 Generator frequency limitations	3.2	14
K/A Category Totals:	3	4	4	3	3	3	Group Point Total:		20

Form 4.1-BWR		BWR Examination Outline						Page 4	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
295002 (APE 2) Loss of Main Condenser Vacuum									
295007 (APE 7) High Reactor Pressure									
295008 (APE 8) High Reactor Water Level		X					Knowledge of the relationship between High Reactor Water Level and the following systems or components: (CFR: 41.7 / 45.8) AK2.04 PCIS/NSSSS	3.6	23
295009 (APE 9) Low Reactor Water Level						X	2.1.45 Ability to identify and interpret diverse indications to validate the response of another indication (CFR: 41.7 / 43.5 / 45.4)	4.3	25
295010 (APE 10) High Drywell Pressure	X						Knowledge of the operational implications and/or cause and effect relationships of the following as they apply to High Drywell Pressure: (CFR: 41.8 to 41.10) AK1.03 Drywell temperature increase	3.8	22
295011 (APE 11) High Containment Temperature (Mark III Containment only)					X		Ability to determine and/or interpret the following as they apply to High Containment Temperature: (CFR: 41.10 / 43.5 / 45.13) AA2.02 Containment pressure	3.8	24
295012 (APE 12) High Drywell Temperature									
295013 (APE 13) High Suppression Pool Water Temperature/ 5									
295014 (APE 14) Inadvertent Reactivity Addition				X			Ability to operate and/or monitor the following as they apply to Inadvertent Reactivity Addition: (CFR: 41.7 / 45.6) AA1.10 HPCS	3.5	26
295017 (APE 17) High Offsite Release Rate									
295020 (APE 20) Inadvertent Containment Isolation									
295022 (APE 22) Loss of Control Rod Drive Pumps									
295029 (EPE 6) High Suppression Pool Water Level									
295032 (EPE 9) High Secondary Containment Area Temperature									
295033 (EPE 10) High Secondary Containment Area Radiation Levels									
295034 (EPE 11) Secondary Containment Ventilation High Radiation / 9									
295035 (EPE 12) Secondary Containment High Differential Pressure									
295036 (EPE 13) Secondary Containment High Sump/Area Water Level									
500000 (EPE 16) High Containment Hydrogen Concentration			X				Knowledge of the reasons for the following responses or actions as they apply to High Containment Hydrogen Concentration: (CFR: 41.5 / 45.6) EK3.05 Operation of wetwell (suppression pool) sprays	3.5	21
K/A Category Point Totals:	1	1	1	1	1	1	Group Point Total:		6

Form 4.1-BWR		BWR Examination Outline Plant Systems—Tier 2/Group 1 (RO/SRO)											Page 5	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
203000 (SF2, SF4 RHR/LPCI) RHR/LPCI: Injection Mode				X								Knowledge of RHR/LPCI: Injection Mode design features and/or interlocks that provide for the following: (CFR: 41.7) K4.06 No-suction path pump trip	3.5	51
205000 (SF4 SCS) Shutdown Cooling	X											Knowledge of the physical connections and/or cause and effect relationships between the Shutdown Cooling System (RHR Shutdown Cooling Mode) and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.18 Feedwater system (BWR 6)	3.5	35
206000 (SF2, SF4 HPCI) High-Pressure Coolant Injection														
207000 (SF4 IC) Isolation (Emergency) Condenser														
209001 (SF2, SF4 LPCS) Low-Pressure Core Spray							X					Ability to predict and/or monitor changes in parameters associated with operation of the Low-Pressure Core Spray System, including: (CFR: 41.5 / 45.5) A1.07 Emergency generator loading	3.9	50
209002 (SF2, SF4 HPCS) High-Pressure Core Spray										X		Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.14 Test return valve	3.3	34
211000 (SF1 SLCS) Standby Liquid Control									X			Ability to monitor automatic operation of the Standby Liquid Control System, including: (CFR: 41.7 / 45.7) A3.08 System initiation	4.1	44
212000 (SF7 RPS) Reactor Protection	X											Knowledge of the physical connections and/or cause and effect relationships between the Reactor Protection System and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.06 Control rod drive hydraulic system	3.9	40
215003 (SF7 IRM) Intermediate-Range Monitor		X										Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 IRM channels/detectors	3.4	29
215004 (SF7 SRMS) Source-Range Monitor			X									Knowledge of the effect that a loss or malfunction of the Source Range Monitor System will have on the following systems or system parameters: (CFR: 41.7 / 45.4) K3.03 RCIS (BWR 6)	3.9	28
215005 (SF7 PRMS) Average Power Range Monitor/Local Power Range Monitor								X				Ability to (a) predict the impacts of the following on the Average Power Range Monitor/Local Power Range Monitor System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6) A2.04 SCRAM trip signals	4.4	36
217000 (SF2, SF4 RCIC) Reactor Core Isolation Cooling											X	2.1.23 Ability to perform general or normal operating procedures during any plant condition (CFR: 41.10 / 43.5 / 45.2 / 45.6)	4.3	38

218000 (SF3 ADS) Automatic Depressurization										X	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.05 ADS timer reset	4.0	52
223002 (SF5 PCIS) Primary Containment Isolation/Nuclear Steam Supply Shutoff										X	Ability to monitor automatic operation of the Primary Containment Isolation System/Nuclear Steam Supply Shutoff, including: (CFR: 41.7 / 45.7) A3.01 System indicating lights and alarms	4.0	39
239002 (SF3 SRV) Safety Relief Valves		X									Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 SRV solenoids	3.7	46
259002 (SF2 RWLCS) Reactor Water Level Control							X				Ability to predict and/or monitor changes in parameters associated with operation of the Reactor Water Level Control System, including: (CFR: 41.5 / 45.5) A1.01 Reactor water level	4.3	49
261000 (SF9 SGTS) Standby Gas Treatment						X					Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Standby Gas Treatment System: (CFR: 41.7 / 45.7) K6.04 Radiation monitoring system	3.4	45
262001 (SF6 AC) AC Electrical Distribution				X							Knowledge of AC Electrical Distribution design features and/or interlocks that provide for the following: (CFR: 41.7) K4.08 Alternate breaker control methods	3.2	42
262002 (SF6 UPS) Uninterruptable Power Supply (AC/DC)										X	2.1.27 Knowledge of system purpose and/or function (CFR: 41.7)	3.9	47
263000 (SF6 DC) DC Electrical Distribution					X						Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the DC Electrical Distribution: (CFR: 41.5 / 45.3) K5.01 Hydrogen generation	3.1	32
264000 (SF6 EGE) Emergency Generators (Diesel/Jet)			X								Knowledge of the effect that a loss or malfunction of the Emergency Generators will have on the following systems or system parameters: (CFR: 41.7 / 45.4) K3.04 Bus frequency/voltage	3.9	37
300000 (SF8 IA) Instrument Air					X						Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the Instrument Air System: (CFR: 41.5 / 45.3) K5.14 Air leaks	3.3	30
400000 (SF8 CCW) Component Cooling Water						X					Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Component Cooling Water System: (CFR: 41.7 / 45.7) K6.13 Fuel pool cooling and cleanup system	3.3	33
510000 (SF4 SWS) Service Water								X			Ability to (a) predict the impacts of the following on the Service Water System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 41.1 / 43.5 / 45.3 / 45.6 / 45.13) A2.02 Abnormal valve positions		48

262001 (SF6 AC) AC Electrical Distribution					X								Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the AC Electrical Distribution: (CFR: 41.5 / 45.3) K5.01 Paralleling AC sources	3.9	43
263000 (SF6 DC) DC Electrical Distribution				X									Knowledge of DC Electrical Distribution design features and/or interlocks that provide for the following: (CFR: 41.7) K4.03 Ground detection	2.9	31
264000 (SF6 EGE) Emergency Generators (Diesel/Jet)							X						Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Emergency Generators: (CFR: 41.7 / 45.7) K6.10 Jacket water components	3.3	41
400000 (SF8 CCW) Component Cooling Water				X									Knowledge of the effect that a loss or malfunction of the Component Cooling Water System will have on the following systems or system parameters: (CFR: 41.7 / 45.6) K3.19 Reactor/turbine pressure regulating system	2.8	27
K/A Category Point Totals:	2	2	3	3	3	3	2	2	2	2	2	2	Group Point Total:		26

Form 4.1-BWR			BWR Examination Outline Plant Systems—Tier 2/Group 2 (RO/SRO)											Page 8	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#	
201001 (SF1 CRDH) CRD Hydraulic															
201002 (SF1 RMCS) Reactor Manual Control															
201003 (SF1 CRDM) Control Rod and Drive Mechanism															
201004 (SF7 RSCS) Rod Sequence Control															
201005 (SF1, SF7 RCIS) Rod Control and Information															
201006 (SF7 RWMS) Rod Worth Minimizer															
202001 (SF1, SF4 RS) Recirculation															
202002 (SF1 RSCTL) Recirculation Flow Control															
204000 (SF2 RWCU) Reactor Water Cleanup															
214000 (SF7 RPIS) Rod Position Information															
215001 (SF7 TIP) Traversing In-Core Probe				X								Knowledge of Traversing In-Core Probe design features and/or interlocks that provide for the following: (CFR: 41.7) K4.03 Radiation shielding	2.9	58	
215002 (SF7 RBMS) Rod Block Monitor															
216000 (SF7 NBI) Nuclear Boiler Instrumentation							X					Ability to predict and/or monitor changes in parameters associated with operation of the Nuclear Boiler Instrumentation, including: (CFR: 41.5 / 45.5) A1.07 RPV level	3.8	62	
219000 (SF5 RHR SPC) RHR/LPCI: Torus/Suppression Pool Cooling Mode			X									Knowledge of the effect that a loss or malfunction of the RHR/LPCI: Torus/Suppression Pool Cooling Mode will have on the following systems or system parameters: (CFR: 41.7 / 45.4) K3.03 Primary containment	3.9	53	
223001 (SF5 PCS) Primary Containment and Auxiliaries															
226001 (SF5 RHR CSS) RHR/LPCI: Containment Spray Mode															
230000 (SF5 RHR SPS) RHR/LPCI: Torus/Suppression Pool Cooling Mode															
233000 (SF9 FPCCU) Fuel Pool Cooling/Cleanup		X										Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 Fuel pool cooling pumps	3.1	59	
234000 (SF8 FH) Fuel Handling Equipment															
239001 (SF3, SF4 MRSS) Main and Reheat Steam															
239003 (SF9 MSIVLC) Main Steam Isolation Valve Leakage Control															

241000 (SF3 RTPRS) Reactor/Turbine Pressure Regulating	X												Knowledge of the physical connections and/or cause and effect relationships between the Reactor/Turbine Pressure Regulating System and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.39 Main and reheat steam system	3.3	57
245000 (SF4 MTGEN) Main Turbine Generator/Auxiliary															
256000 (SF2 CDS) Condensate						X							Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Condensate System: (CFR: 41.7 / 45.7) K6.09 Offgas system	2.6	61
259001 (SF2 FWS) Feedwater															
268000 (SF9 RW) Radwaste										X			Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.02 Primary containment sump pumps	3.1	54
271000 (SF9 OG) Offgas															
272000 (SF7, SF9 RMS) Radiation Monitoring															
286000 (SF8 FPS) Fire Protection															
288000 (SF9 PVS) Plant Ventilation															
290001 (SF5 SC) Secondary Containment									X				Ability to monitor automatic operation of the Secondary Containment, including: (CFR: 41.7 / 45.7) A3.01 Secondary containment isolation	4.1	55
290003 (SF9 CRV) Control Room Ventilation					X								Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the Control Room Ventilation: (CFR: 41.5 / 45.3) K5.01 Control of airborne contamination (e.g., radiological, toxic gas, smoke)	3.6	63
290002 (SF4 RVI) Reactor Vessel Internals										X			2.1.28 Knowledge of the purpose and function of major system components and controls (CFR: 41.7)	4.1	56
510001 (SF8 CWS) Circulating Water								X					Ability to (a) predict the impacts of the following on the Circulating Water System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5, 41.1 / 43.5 / 45.3, 45.6, 45.13) A2.04 A3 System leakage/rupture	3.2	60
K/A Category Point Totals:	1	1	1	1	1	1	1	1	1	1	1	1	Group Point Total:		11

Form 4.1-COMMON Common Examination Outline

Facility: Grand Gulf			Date of Exam:			
Generic Knowledge and Abilities—Tier 3 (RO/SRO)						
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.4	Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, “no-solo” operation, maintenance of active license status, 10 CFR Part 55 (CFR: 41.10 / 43.2)	3.3	65		
	2.1.37	Knowledge of procedures, guidelines, or limitations associated with reactivity management (CFR: 41.1 / 41.5 / 41.10 / 43.6 / 45.6)	4.3	67		
	Subtotal		N/A		N/A	
2. Equipment Control	2.2.22	Knowledge of limiting conditions for operation and safety limits (CFR: 41.5 / 43.2 / 45.2)	4.0	68		
	2.2.43	Knowledge of the process used to track inoperable alarms (CFR: 41.10 / 43.5 / 45.13)	3.0	64		
	Subtotal		N/A		N/A	
3. Radiation Control	2.3.12	Knowledge of radiological safety principles and procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, or alignment of filters (CFR: 41.12 / 43.4 / 45.9 / 45.10)	3.2	66		
	Subtotal		N/A		N/A	
4. Emergency Procedures/ Plan	2.4.35	Knowledge of nonlicensed operator responsibilities during an emergency (CFR: 41.10 / 43.1/ 43.5 / 45.13)	3.8	69		
	Subtotal		N/A		N/A	
Tier 3 Point Total				6		7

Facility: Grand Gulf		Date of Exam:		
Theory—Tier 4 (RO)				
Category	K/A #	Topic	RO	
			IR	#
Reactor Theory	K1.11	292004 Reactivity Coefficients K1.11 Describe the effect on the magnitude of void coefficient from changes in the following: Core void fraction	2.6	71
	K1.10	292005 Control Rods K1.10 State the purpose of flux shaping	3.3	73
	K1.24	292008 Reactor Operational Physics K1.24 Describe the parameters to be monitored and controlled during rod pattern exchanges	3.2	74
	Subtotal		N/A	
Thermodynamics	K1.14	293004 Thermodynamic Processes K1.14 Explain the condensing process	2.7	72
	K1.05	293006 Fluid Statics and Dynamics K1.05 Explain operational implications of fluid/water hammer	3.3	70
	K1.04	293008 Thermal-Hydraulics K1.04 Describe means by which boiling improves convection heat transfer	2.7	75
	Subtotal		N/A	
Tier 4 Point Total				6

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		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Total	A2		G	Total				
1. Emergency and Abnormal Plant Evolutions	1				N/A					N/A			20	4		3	7				
	2												6	2	1	3					
	Tier Totals												26	6	4	10					
2. Plant Systems	1												26	3		2	5				
	2												11	1	1	1	3				
	Tier Totals												37	5		3	8				
3. Generic Knowledge and Abilities Categories	CO			EC			RC		EM		6		CO	EC	RC	EM	7				
	2			2			1		1				2	2	1	2					
4. Theory	Reactor Theory				Thermodynamics						6										
	3				3																

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Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
295001 (APE 1) Partial or Complete Loss of Forced Core Flow Circulation									
295003 (APE 3) Partial or Complete Loss of AC Power					X		Ability to determine and/or interpret the following as they apply to Partial or Complete Loss of AC Power: (CFR: 41.10 / 43.5 / 45.13) AA2.03 Battery status	3.9	79
295004 (APE 4) Partial or Total Loss of DC Power									
295005 (APE 5) Main Turbine Generator Trip									
295006 (APE 6) Scram					X		Ability to determine and/or interpret the following as they apply to SCRAM: (CFR: 41.10 / 43.5 / 45.13) AA2.05 Whether a reactor SCRAM has occurred	4.5	81
295016 (APE 16) Control Room Abandonment / 7					X		Ability to determine and/or interpret the following as they apply to Control Room Abandonment: (CFR: 41.10 / 43.5 / 45.13) AA2.05 Drywell pressure	3.6	78
295018 (APE 18) Partial or Complete Loss of CCW									
295019 (APE 19) Partial or Complete Loss of Instrument Air						X	2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm (CFR: 41.10 / 43.5 / 45.3 / 45.12)	4.3	82
295021 (APE 21) Loss of Shutdown Cooling									
295023 (APE 23) Refueling Accidents									
295024 (EPE 1) High Drywell Pressure									
295025 (EPE 2) High Reactor Pressure					X		Ability to determine and/or interpret the following as they apply to High Reactor Pressure: (CFR: 41.10 / 43.5 / 45.13) EA2.01 Reactor pressure	4.3	77
295026 (EPE 3) Suppression Pool High Water Temperature						X	2.4.2 Knowledge of system setpoints, interlocks and automatic actions associated with emergency and abnormal operating procedure entry conditions (CFR: 41.7 / 45.7 / 45.8)	4.6	80
295027 (EPE 4) High Containment Temperature (Mark III Containment Only)									
295028 (EPE 5) High Drywell Temperature (Mark I and Mark II only)									
295030 (EPE 7) Low Suppression Pool Water Level									
295031 (EPE 8) Reactor Low Water Level									
295037 (EPE 14) Scram Condition Present and Reactor Power Above APRM Downscale or Unknown									
295038 (EPE 15) High Offsite Radioactivity Release Rate									
600000 (APE 24) Plant Fire on Site									
700000 (APE 25) Generator Voltage and Electric Grid Disturbances						X	2.4.18 Knowledge of the specific bases for emergency and abnormal operating procedures (CFR: 41.10 / 43.1 / 45.13)	4.0	76
K/A Category Totals:	0	0	0	0	4	3	Group Point Total:		7

Form 4.1-BWR							BWR Examination Outline			Page 3	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/SRO)											
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#		
295002 (APE 2) Loss of Main Condenser Vacuum					X		Ability to determine and/or interpret the following as they apply to Loss of Main Condenser Vacuum: (CFR: 41.10 / 43.5 / 45.13) AA2.07 Turbine limitations	3.4	84		
295008 (APE 8) High Reactor Water Level											
295009 (APE 9) Low Reactor Water Level											
295010 (APE 10) High Drywell Pressure											
295011 (APE 11) High Containment Temperature (Mark III Containment only)											
295012 (APE 12) High Drywell Temperature											
295013 (APE 13) High Suppression Pool Water Temperature/ 5											
295014 (APE 14) Inadvertent Reactivity Addition											
295017 (APE 17) High Offsite Release Rate											
295020 (APE 20) Inadvertent Containment Isolation						X	2.4.51 Knowledge of emergency operating procedure exit conditions (e.g., emergency condition no longer exists or severe accident guideline entry is required) (CFR: 41.10 / 43.5 / 45.13)	4.0	83		
295022 (APE 22) Loss of Control Rod Drive Pumps											
295029 (EPE 6) High Suppression Pool Water Level					X		Ability to determine and/or interpret the following as they apply to Suppression Pool High Water Temperature: (CFR: 41.10 / 43.5 / 45.13) EA2.03 Reactor pressure	3.7	85		
295032 (EPE 9) High Secondary Containment Area Temperature											
295033 (EPE 10) High Secondary Containment Area Radiation Levels											
295034 (EPE 11) Secondary Containment Ventilation High Radiation / 9											
295035 (EPE 12) Secondary Containment High Differential Pressure											
295036 (EPE 13) Secondary Containment High Sump/Area Water Level											
500000 (EPE 16) High Containment Hydrogen Concentration											
K/A Category Point Totals:	0	0	0	0	2	1	Group Point Total:				3

Form 4.1-BWR			BWR Examination Outline Plant Systems—Tier 2/Group 1 (RO/SRO)											Page 4	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#	
203000 (SF2, SF4 RHR/LPCI) RHR/LPCI: Injection Mode															
205000 (SF4 SCS) Shutdown Cooling															
206000 (SF2, SF4 HPCI) High-Pressure Coolant Injection															
207000 (SF4 IC) Isolation (Emergency) Condenser															
209001 (SF2, SF4 LPCS) Low-Pressure Core Spray															
209002 (SF2, SF4 HPCS) High-Pressure Core Spray															
211000 (SF1 SLCS) Standby Liquid Control								X				Ability to (a) predict the impacts of the following on the Standby Liquid Control System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6) A2.01 Pump trip	3.8	90	
212000 (SF7 RPS) Reactor Protection															
215003 (SF7 IRM) Intermediate-Range Monitor															
215004 (SF7 SRMS) Source-Range Monitor															
215005 (SF7 PRMS) Average Power Range Monitor/Local Power Range Monitor											X	2.4.6 Knowledge of emergency and abnormal operating procedures major action categories (CFR: 41.10 / 43.5 / 45.13)	4.7	89	
217000 (SF2, SF4 RCIC) Reactor Core Isolation Cooling															
218000 (SF3 ADS) Automatic Depressurization											X	2.4.12 Knowledge of operating crew responsibilities during emergency and abnormal operations (CFR: 41.10 / 45.12)	4.3	87	
223002 (SF5 PCIS) Primary Containment Isolation/Nuclear Steam Supply Shutoff															
239002 (SF3 SRV) Safety Relief Valves															
259002 (SF2 RWLCS) Reactor Water Level Control								X				Ability to (a) predict the impacts of the following on the Reactor Water Level Control System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6) A2.07 Loss of comparator bias signal	2.7	86	
261000 (SF9 SGTS) Standby Gas Treatment															
262001 (SF6 AC) AC Electrical Distribution															
262002 (SF6 UPS) Uninterruptable Power Supply (AC/DC)								X				Ability to (a) predict the impacts of the following on the Uninterruptable Power Supply (AC/DC) and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6) A2.05 Loss of UPS	3.9	88	

263000 (SF6 DC) DC Electrical Distribution																	
264000 (SF6 EGE) Emergency Generators (Diesel/Jet)																	
300000 (SF8 IA) Instrument Air																	
400000 (SF8 CCW) Component Cooling Water																	
510000 (SF4 SWS) Service Water																	
K/A Category Point Totals:	0	0	0	0	0	0	0	3	0	0	2	Group Point Total:					5

Form 4.1-BWR			BWR Examination Outline Plant Systems—Tier 2/Group 2 (RO/SRO)											Page 6	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#	
201001 (SF1 CRDH) CRD Hydraulic															
201002 (SF1 RMCS) Reactor Manual Control															
201003 (SF1 CRDM) Control Rod and Drive Mechanism															
201004 (SF7 RSCS) Rod Sequence Control															
201005 (SF1, SF7 RCIS) Rod Control and Information															
201006 (SF7 RWMS) Rod Worth Minimizer															
202001 (SF1, SF4 RS) Recirculation															
202002 (SF1 RSCTL) Recirculation Flow Control															
204000 (SF2 RWCU) Reactor Water Cleanup															
214000 (SF7 RPIS) Rod Position Information															
215001 (SF7 TIP) Traversing In-Core Probe															
215002 (SF7 RBMS) Rod Block Monitor															
216000 (SF7 NBI) Nuclear Boiler Instrumentation															
219000 (SF5 RHR SPC) RHR/LPCI: Torus/Suppression Pool Cooling Mode															
223001 (SF5 PCS) Primary Containment and Auxiliaries															
226001 (SF5 RHR CSS) RHR/LPCI: Containment Spray Mode															
230000 (SF5 RHR SPS) RHR/LPCI: Torus/Suppression Pool Cooling Mode															
233000 (SF9 FPCCU) Fuel Pool Cooling/Cleanup															
234000 (SF8 FH) Fuel Handling Equipment				X								Knowledge of Fuel Handling System design features and/or interlocks that provide for the following: (CFR: 41.7) K4.06 Protection from dropping a fuel assembly	3.5	92	
239001 (SF3, SF4 MRSS) Main and Reheat Steam															
239003 (SF9 MSIVLC) Main Steam Isolation Valve Leakage Control															
241000 (SF3 RTPRS) Reactor/Turbine Pressure Regulating															
245000 (SF4 MTGEN) Main Turbine Generator/Auxiliary															
256000 (SF2 CDS) Condensate															
259001 (SF2 FWS) Feedwater															
268000 (SF9 RW) Radwaste															

271000 (SF9 OG) Offgas									X			Ability to (a) predict the impacts of the following on the Offgas System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 45.6 / 43.5 / 45.8) A2.06 Offgas system holdup volume explosion/ fire	3.3	91
272000 (SF7, SF9 RMS) Radiation Monitoring														
286000 (SF8 FPS) Fire Protection														
288000 (SF9 PVS) Plant Ventilation											X	2.1.32 Ability to explain and apply system precautions, limitations, notes, or cautions (CFR: 41.10 / 43.2 / 45.12)	4.0	93
290001 (SF5 SC) Secondary Containment														
290003 (SF9 CRV) Control Room Ventilation														
290002 (SF4 RVI) Reactor Vessel Internals														
510001 (SF8 CWS) Circulating Water														
K/A Category Point Totals:				1					1			1	Group Point Total:	3

Form 4.1-COMMON Common Examination Outline

Facility: Grand Gulf			Date of Exam:			
Generic Knowledge and Abilities—Tier 3 (RO/SRO)						
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.15	Knowledge of administrative requirements for temporary management direction, such as standing orders, night orders, or operations memoranda (CFR: 41.10 / 45.12)			3.4	99
	2.1.42	Knowledge of new and spent fuel movement procedures (SRO Only) (CFR: 43.7 / 45.13)			3.4	100
	Subtotal		N/A		N/A	
2. Equipment Control	2.2.25	Knowledge of the bases in technical specifications for limiting conditions for operation and safety limits (SRO Only) (CFR: 43.2)			4.2	98
	2.2.37	Ability to determine operability or availability of safety-related equipment (SRO Only) (CFR: 43.2 / 43.5 / 45.12)			4.6	97
	Subtotal		N/A		N/A	
3. Radiation Control	2.3.6	Ability to approve liquid or gaseous release permits (CFR: 41.13 / 43.4 / 45.10)			3.8	95
	Subtotal		N/A		N/A	
4. Emergency Procedures/ Plan	2.4.16	Knowledge of emergency and abnormal operating procedures implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, or severe accident management guidelines (CFR: 41.10 / 43.5 / 45.13)			4.4	94
	2.4.40	Knowledge of SRO responsibilities in emergency plan implementing procedures (SRO Only) (CFR: 43.5 / 45.11)			4.5	96
	Subtotal		N/A		N/A	
Tier 3 Point Total				6		7

Form 4.1-1 Record of Rejected Knowledge and Abilities

Refer to Examination Standard (ES)-4.2, “Developing Written Examinations,” Section B.3, for deviations from the approved written examination outline.

[illegible]

Form 3.2-1 Administrative Topics Outline

Facility: <u>Grand Gulf</u>		Date of Examination: <u>Jan 2024</u>
Examination Level: RO		Operating Test Number: <u>2024</u>
Administrative Topic (Step 1)	Activity and Associated K/A (Step 2)	Type Code (Step 3)
Conduct of Operations	Loss of Shutdown Cooling, Time to 200°F Determination K/A 2.1.25 (3.9), 05-1-02-III-1	P, D, R 2021 NRC
Conduct of Operations	Perform Daily Operating Logs K/A 2.1.18 (3.6), 06-OP-1000-D-0001	N, S
Equipment Control	Determine Isolation Boundary for SGBT Fan Work K/A 2.2.13 (4.1), EN-OP-102	N, R
Radiation Control		
Emergency Plan	Reactor Water Level Determination K/A 2.4.34 (4.2), 05-1-02-II-1	D, R

Location:

(C)ontrol room, (S)imulator, or Class(R)oom

Source and Source Criteria:

(P)revious two NRC exams (no more than one JPM that is **randomly selected** from last two NRC exams)

(D)irect from bank (no more than three for ROs, no more than four for SROs and RO retakes)

(N)ew or Significantly (M)odified from bank (no fewer than one)

Form 3.2-1 Administrative Topics Outline

Facility: <u>Grand Gulf</u>		Date of Examination: <u>Jan 2024</u>
Examination Level: <u>SRO</u>		Operating Test Number: <u>2024</u>
Administrative Topic (Step 1)	Activity and Associated K/A (Step 2)	Type Code (Step 3)
Conduct of Operations	Reactor Water Chemistry Required Actions K/A 2.1.34 (3.5), 05-1-02-V-12	P, D, R 2021 NRC
Conduct of Operations	Determine Reportability Requirements K/A 2.1.18 (3.8), EN-LI-108	M, R
Equipment Control	Review Daily Operating Logs, Determine Technical Specification Impact K/A 2.2.12 (4.1), 06-OP-1000-D-0001, Technical Specifications	N, R
Radiation Control	Emergency Exposure Limits K/A 2.3.12 (3.7), 10-S-01-17, EN-RP-201	D, R
Emergency Plan	Perform Emergency Classification K/A 2.4.41 (4.6), 10-S-01-1	D, R

Location:

(C)ontrol room, (S)imulator, or Class(R)oom

Source and Source Criteria:

(P)revious two NRC exams (no more than one JPM that is **randomly selected** from last two NRC exams)

(D)irect from bank (no more than three for ROs, no more than four for SROs and RO retakes)

(N)ew or Significantly (M)odified from bank (no fewer than one)

Form 3.2-2 Control Room/In-Plant Systems Outline

Facility: Grand Gulf

Date of Examination: Jan 2024

Operating Test Number: 2024

Exam Level: RO / SRO-I / **SRO-U**

System/JPM Title	Type Code	Safety Function
Control Room Systems		
S1. Rotate CRD Pumps; CRD Pump Low Oil Pressure K/A 201001 A4.01 (3.7), 04-1-01-C11-1, 04-1-02-1H13-P601-22A-G3	P, D, A, S 2021 NRC	1
C1. Defeat Feedwater Pump Level 9 Trips K/A 259001 A3.10 (3.9), 05-S-01-EP-1 Attachment 6	D, C	2
S2. Open MSIVs; Steam Leak Develops with Failure to Automatically Isolate K/A 239001 A4.01 (4.4), 04-1-01-B21-1, ARI P601-18A-A3	M, A, L, S	3
S3. Perform LPCS Surveillance, High Pump Current K/A 209001 A4.01 (4.3), 06-OP-1E21-Q-0006, ARI P601-21A-A7	N, A, EN, S	4
S4. Place SGTs in Standby, Low Building Vacuum K/A 290001 A4.13 (3.6), 04-1-01-T48-1, ARI P870-2A-E3	N, A, EN, S	5
S5. Withdraw SRMs K/A 215004 A4.04 (3.5), 04-1-01-C51-1	N, L, S	7
S6. Swap Plant Air Compressors K/A 300000 A4.02 (3.5), 04-1-01-P51-1	N, S	8
S7. Start the Fuel Pool Cooling and Cleanup System (RO Only) K/A 233000 A4.09 (3.1), 04-1-01-G41-1	P, D, S 2021 NRC	9

In-Plant Systems		
P1. Manually Venting the Scram Air Header K/A 295037 EA1.05 (3.9), 05-S-01-EP-1 Att. 23	D, E, R	1
P2. HPCS Diesel Generator Emergency Shutdown K/A 264000 A4.04 (4.1), 04-1-01-P81-1, 04-1-02-1H22-P118	D, A, E, R	6
P3. Initiate Fire Suppression to Standby Gas Treatment Filter Train K/A 286000 2.1.30 (4.4/4.0), 04-1-02-1H13-P870-2A-B2	D, E, R	8

Code	License Level Criteria		
	RO	SRO-I	SRO-U
(A)lternate path	4-6 (5)	4-6 (5)	2-3 (3)
(C)ontrol room	(1)	(1)	(0)
(D)irect from bank	≤ 9 (6)	≤ 8 (5)	≤ 4 (2)
(E)mergency or abnormal in-plant	≥ 1 (3)	≥ 1 (3)	≥ 1 (2)
(EN)gineered safety feature (for control room system)	≥ 1 (2)	≥ 1 (2)	≥ 1 (1)
(L)ow power/shutdown	≥ 1 (2)	≥ 1 (2)	≥ 1 (2)
(N)ew or (M)odified from bank (must apply to at least one alternate path JPM)	≥ 2 (5/3)	≥ 2 (5/3)	≥ 1 (3/2)
(P)revious two exams (randomly selected)	≤ 3 (2)	≤ 3 (1)	≤ 2 (0)
(R)adiologically controlled area	≥ 1 (3)	≥ 1 (3)	≥ 1 (2)
(S)imulator	(7)	(6)	(3)

Form 3.3-1 Scenario Outline

Facility:	Grand Gulf	Scenario #:	NRC-1
Scenario Source:	New	Op. Test #:	2024
Examiners:		Applicants/	
		Operators:	
Initial Conditions:	The plant is operating at approximately 85% power. CRD pump B is out of service for maintenance.		
Turnover:	Start EHC control fluid pump B and place EHC control fluid pump A in standby per 04-1-01-N32-1 Section 5.3.5. The procedure is in progress up to step 5.3.5.2. Then, withdraw control rods to raise the rod line per the provided reactivity instructions.		
Critical Tasks:	CT-1: Given a steam leak from RCIC into the Auxiliary Building and a failure of RCIC to automatically isolate, the crew will isolate the steam leak from RCIC, in accordance with EP-4. The steam leak must be isolated in time to prevent the need for a Reactor scram due to exceeding a Max Safe Value. CT-2: Given the plant operating at power with rising Drywell pressure and a failure of RPS to scram the Reactor, the crew will insert control rods by manually initiating ARI, in accordance with 05-1-02-I-1 and/or EP-2A. ARI must be manually initiated within 5 minutes of when Drywell pressure exceeds 1.23 psig. CT-3: Given a coolant leak, a loss of high-pressure injection systems, and the inability to restore and maintain Reactor water level above -191", the crew will perform an Emergency Depressurization, in accordance with EP-2. Reactor water level must be restored and maintained above -191" within 15 minutes of lowering below -191".		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Swap EHC Pumps SOI 04-1-01-N32-1
2	N/A	R – ATC, SRO	Withdraw Control Rods SOI 04-1-01-C11-2
3	c51009_2 c51010_3	I – ATC, SRO MC – ATC TS – SRO	Two APRMs Fail Sequentially SOI 04-1-01-C51-1, Technical Specification 3.3.1.1
4	e51050	C – BOP, SRO MC – BOP TS – SRO	RCIC Steam Leak into Auxiliary Building, RCIC Fails to Automatically Isolate EP-4, Technical Specifications 3.5.3 and 3.3.6.1
5	fw123b rr217a	C – All	Feedwater Pump Trip, Recirc FCV A Fails to Runback ONEP 05-1-02-V-7, ONEP 05-1-02-III-3
6	rr063	M – All MC – ATC, BOP	Coolant Leak in Containment ONEP 05-1-02-I-1, EP-2, EP-3
7	c71162	I – ATC, SRO MC – ATC	Automatic and Manual RPS Scrams Fail, ARI Works ONEP 05-1-02-I-1, EP-2, EP-2A
8	fw118	C – All	Condensate Booster Pumps Trip EP-2
9	e22052	C – All MC – ATC, BOP	HPCS Pump Trip EP-2
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control			

Facility: Grand Gulf		Scenario No.: NRC-1	Op-Test No.: 2024
1. Malfunctions after EOP entry (1-2) Events 7, 8, 9	3		
2. Abnormal events (2-4) Events 4 & 5	2		
3. Major transients (1-2) Event 6	1		
4. EOPs entered/requiring substantive actions (1-2) EP-2, EP-3	2		
5. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set) EP-2 ED Leg	1		
6. Pre-identified critical tasks (≥ 2)	3		

Form 3.3-1 Scenario Outline

Facility:	Grand Gulf	Scenario #:	NRC-2
Scenario Source:	New	Op. Test #:	2024
Examiners:		Applicants/	
		Operators:	
Initial Conditions:	The plant is operating at approximately 100% power. CCW pump C is out of service for maintenance. Suppression Pool makeup from HPCS is in progress.		
Turnover:	Secure Suppression Pool makeup from HPCS per 04-1-01-E22-1. The procedure is in progress up to step 6.4.2.d.(3). Then, lower Reactor power to 95% using Recirc flow per the provided reactivity instructions.		
Critical Tasks:	CT-1: Given a failure to scram with Reactor power above 5%, the crew will lower Reactor power by one or more of the following methods, in accordance with EOP-2A: • Terminating and preventing all RPV injection except SLC, RCIC and CRD • Tripping Recirc pumps • Injecting boron The Reactor power reduction must be initiated within ten minutes of the start of the failure to scram. CT-2: Given a failure to scram, the crew will initiate control rod insertion, in accordance with EOP-2A. All insertable control rods must be inserted within one hour of the start of the failure to scram.		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Secure Suppression Pool Makeup from HPCS SOI 04-1-01-E22-1
2	N/A	R – ATC, SRO	Lower Reactor Power using Recirc IOI 03-1-01-2
3	ltb21 n091 e21051	I – BOP, SRO MC – BOP TS – SRO	Spurious Initiation of Div 1 ECCS, LPCS Pump Trips 04-1-01-E12-1 Attachment IX, Technical Specification 3.5.1
4	rr011e	C – ATC, SRO TS – SRO	Jet Pump Failure ONEP 05-1-02-III-6, ONEP 05-1-02-III-3, Technical Specifications 3.4.1 and 3.4.3
5	p43152a	C – BOP, SRO MC – BOP	TBCW Pump Trip, Standby Pump Fails to Automatically Start ONEP 05-1-02-V-2
6	rr071	C – ATC, SRO	Fuel Failure ONEP 05-1-02-II-2, ONEP 05-1-02-I-1, EP-2
7	c11167	M – All MC – ATC, BOP	RPS and ARI Fail to Insert Control Rods EP-2A
8	c41c001	C – BOP, SRO	SLC Pumps Trip EP-2A
9	rr217	C – ATC, SRO MC – ATC	Recirc Flow Control Valves Fail to Automatically Runback EP-2A
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control			

Facility: Grand Gulf		Scenario No.: NRC-2	Op-Test No.: 2024
1. Malfunctions after EOP entry (1-2) Events 8 & 9	2		
2. Abnormal events (2-4) Events 3, 4, 5, 6	4		
3. Major transients (1-2) Event 7	1		
4. EOPs entered/requiring substantive actions (1-2) EP-2	1		
5. Entry into a contingency EOP with substantive actions (≥1 per scenario set) EP-2A	1		
6. Pre-identified critical tasks (≥2)	2		

Form 3.3-1 Scenario Outline

Facility:	Grand Gulf	Scenario #:	NRC-3
Scenario Source:	New	Op. Test #:	2024
Examiners:		Applicants/	
		Operators:	
Initial Conditions:	The plant is operating at approximately 5% power during a shutdown. SLC pump A is out of service for maintenance. IRM C is bypassed.		
Turnover:	Return IRM C to service per 04-1-01-C51-1 section 5.3. Then, continue the shutdown by inserting control rods per the provided reactivity instructions.		
Critical Tasks:	CT-1: Given a leak from the Suppression Pool and lowering Suppression Pool water level, isolate the leak, in accordance with EP-4. The leak must be isolated in time to prevent Suppression Pool water level from lowering below 14.5'. CT-2: Given the plant operating at power with an un-isolable primary system discharging into Secondary Containment, the crew will insert a manual Reactor scram, in accordance with EP-4. The scram must be inserted before two areas reach a Maximum Safe Temperature. CT-3: Given an un-isolable primary system discharging into Secondary Containment and two areas exceeding Maximum Safe Temperatures, the crew will perform an Emergency Depressurization, in accordance with EP-4. The Emergency Depressurization must be initiated within 15 minutes of when the second Maximum Safe Temperature is exceeded.		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Return IRM to Service 04-1-01-C51-1
2	N/A	R – ATC, SRO	Insert Control Rods 04-1-01-C11-2
3	z161161	C – ATC, SRO TS – SRO	Control Rod Drift Out ONEP 05-1-02-IV-1, Technical Specification 3.1.3
4	ct218c ct219c	C – BOP, SRO TS – SRO	Suppression Pool Leak from RHR, RHR Room Door Fails EP-3, EP-4, Technical Specification 3.5.1
5	fw274	I – ATC, SRO MC – ATC	Startup Level Control Valve Drifts Closed in Auto ONEP 05-1-02-V-7
6	e51050 e51187a e51187b	M – All	RCIC Steam Leak in Reactor Building, RCIC Isolation Valve Breaker Trip on Stroke EP-4, ONEP 05-1-02-I-1, EP-2, EP-2 ED Leg
7	Remote	C – BOP, SRO MC – BOP	RCIC Fails to Automatically Isolate EP-4
8	tc248	C – ATC, SRO MC – ATC	EHC Pumps Trip EP-2
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control			

Facility: Grand Gulf		Scenario No.: NRC-3	Op-Test No.: 2024
1. Malfunctions after EOP entry (1-2) Events 7 & 8	2		
2. Abnormal events (2-4) Events 3, 4, 5	3		
3. Major transients (1-2) Event 6	1		
4. EOPs entered/requiring substantive actions (1-2) EP-2, EP-4	2		
5. Entry into a contingency EOP with substantive actions (≥1 per scenario set) EP-2 ED Leg	1		
6. Pre-identified critical tasks (≥2)	3		

Form 3.4-1 Events and Evolutions Checklist

Facility: Grand Gulf			Date of Exam: Jan 2024			Operating Test No.: 2024									
A P P L I C A N T	E V E N T T Y P E	Scenarios													
		1			2						T O T A L	M I N I M U M (*)			
		CREW POSITION			CREW POSITION			CREW POSITION							
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P					
		R	I	U											
U1	RX											0	1	1	0
	NOR	1										1	1	1	1
	I/C	3,4,5,7,8,9										6	4	4	2
	MAJ	6										1	2	2	1
	Man. Ctrl											0	1	1	0
	TS	3,4										2	0	2	2
U2	RX											0	1	1	0
	NOR				1							1	1	1	1
	I/C				3,4,5,6,8,9							6	4	4	2
	MAJ				7							1	2	2	1
	Man Ctrl											0	1	1	0
	TS				3,4							2	0	2	2
I1 & I3	RX					2						1	1	1	0
	NOR	1										1	1	1	1
	I/C	3,4,5,7,8,9				4,6,9						9	4	4	2
	MAJ	6				7						2	2	2	1
	Man Ctrl					7,9						2	1	1	0
	TS	3,4										2	0	2	2
I2 & I4	RX											0	1	1	0
	NOR			1	1							2	1	1	1
	I/C			4,5,8,9	3,4,5,6,8,9							10	4	4	2
	MAJ			6	7							2	2	2	1
	Man Ctrl			4,6								2	1	1	0
	TS				3,4							2	0	2	2

A P P L I C A N T	E V E N T T Y P E	Scenarios												
		1			2						T O T A L	M I N I M U M (*)		
		CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
													R	I
R1, R3, & R4	RX		2								1	1	1	0
	NOR						1				1	1	1	1
	I/C		3,5,7,8 ,9				3,5,6,8				9	4	4	2
	MAJ		6				7				2	2	2	1
	Man. Ctrl		3,6,7				3,5,7				6	1	1	0
	TS										0	0	2	2
R2	RX					2					1	1	1	0
	NOR			1							1	1	1	1
	I/C			4,5,8,9		4,6,9					7	4	4	2
	MAJ			6		7					2	2	2	1
	Man Ctrl			4,6		7,9					4	1	1	0
	TS										0	0	2	2

Form 3.4-1 Instructions for the Events and Evolutions Checklist

1. Mark the applicant license level for each simulator operating test number.
2. For the set of scenario columns, fill in the associated event number from Form 3.3-1, "Scenario Outline," to show the specific event types being used for the applicant while in the assigned crew position for that scenario.

* Minimums are subject to the instructions in Section C.2, "License Level Criteria."

KEY: RX = Reactivity Manipulation; NOR = Normal Evolution; I/C = Instrument/Component Failure; MAJ = Major Transient; Man. Ctrl = Manual Control of Automatic Function; TS = Technical Specification Evaluation; RO = Reactor Operator; SRO-I or I = Instant Senior Reactor Operator; SRO-U or U = Upgrade Senior Reactor Operator; SRO = Senior Reactor Operator; ATC = At the Controls; and BOP = Balance of Plan