

Facility: Grand Gulf		Date of Exam: March 9, 2009															
Tier	Group	RO K/A Category Points											SRO-Only Points				
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total	
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			4	3	N/A			4	20	3	4	7
	2	1	1	1	N/A			1	2	N/A			1	7	2	1	3
	Tier Totals	4	4	4	N/A			5	5	N/A			5	27	5	5	10
2. Plant Systems	1	3	2	2	3	2	3	2	2	2	2	3	26	2	3	5	
	2	1	1	1	2	1	1	1	1	1	1	1	12	2	1	3	
	Tier Totals	4	3	3	5	3	4	3	3	3	3	4	38	4	4	8	
3. Generic Knowledge and Abilities Categories					1	2	3	4				10	1	2	3	4	7
					3	3	2	2					3	2	1	1	

Note:

- Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
- The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
- Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.
- Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
- Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
- Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
- * The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
- On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above. Use duplicate pages for RO and SRO-only exams.
- For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401 BWR Examination Outline Form ES-401-1 Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4				R			Ability to operate and/or monitor the Neutron monitoring system as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION (CFR: 41.7 / 45.6) (AA1.06 - RO)	3.3	1R
					S		Ability to determine and/or interpret the jet pump operability as it applies to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION (CFR: 41.10 / 43.5 / 45.13) (AA2.05 - SRO)	3.4	1S
295003 Partial or Complete Loss of AC / 6	R						Knowledge of the operational implications of Load shedding as it applies to PARTIAL OR COMPLETE LOSS OF A.C. POWER (CFR: 41.8 to 41.10) (AK1.02)	3.1	2R
295004 Partial or Total Loss of DC Pwr / 6					R		Ability to determine and/or interpret the extent of partial or complete loss of D.C. power as it applies to PARTIAL OR COMPLETE LOSS OF D.C. POWER (CFR: 41.10 / 43.5 / 45.13) (AA2.02)	3.5	3R
295005 Main Turbine Generator Trip / 3	R						Knowledge of the operational implications of Pressure effects on reactor level as it applies to MAIN TURBINE GENERATOR TRIP (CFR: 41.8 to 41.10) (AK1.03)	3.5	4R
295006 SCRAM / 1						R	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) (2.1.7)	4.4	5R
295016 Control Room Abandonment / 7						R	Knowledge of limiting conditions for operations and safety limits. (CFR: 41.5 / 43.2 / 45.2) (2.2.22 - RO)	4.0	6R
						S	Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13) (2.4.11 - SRO)	4.2	2S
295018 Partial or Total Loss of CCW / 8		R					Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER and system loads (CFR: 41.7 / 45.8) (AK2.01)	3.3	7R
295019 Partial or Total Loss of Inst. Air / 8						R	Ability to manage the control room crew during plant transients. (CFR: 41.10 / 43.5 / 45.12 / 45.13) (2.1.6)	3.8	8R
295021 Loss of Shutdown Cooling / 4				R			Ability to operate and/or monitor Alternate heat removal methods as they apply to LOSS OF SHUTDOWN COOLING (CFR: 41.7 / 45.6) (AA1.04)	3.7	9R
295023 Refueling Acc / 8			R				Knowledge of the reasons for responses of interlocks associated with fuel handling equipment as they apply to REFUELING ACCIDENTS (CFR: 41.5 / 45.6) (AK3.02) (RO)	3.4	10R

295024 High Drywell Pressure / 5				R		Ability to operate and/or monitor the emergency generators as they apply to HIGH DRYWELL PRESSURE (CFR: 41.7 / 45.6) (EA1.06)	3.7	11R
295025 High Reactor Pressure / 3					S	Knowledge of the interrelations between HIGH REACTOR PRESSURE and the reactor/turbine pressure regulating system (Plant Specific) (CFR: 41.7 / 45.8) (EK2.08 - RO)	3.7 (RO)	12R
						Ability to interpret and execute procedure steps. (CFR: 41.10 / 43.5 / 45.12) (2.1.20 – SRO)	4.6 (SRO)	3S
295026 Suppression Pool High Water Temp. / 5					S	Ability to determine and/or interpret reactor pressure as it applies to SUPPRESSION POOL HIGH WATER TEMPERATURE: (CFR: 41.10 / 43.5 / 45.13) (EA2.03 - SRO)	4.0 (SRO)	4S
					R	Knowledge of conservative decision making practices. (CFR: 41.10 / 43.5 / 45.12) (2.1.39 – RO)	3.6 (RO)	13R
295027 High Containment Temperature / 5				R		Knowledge of the interrelations between HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY) and the containment spray (plant-specific): (CFR: 41.7 / 45.8) (EK2.01)	3.2	14R
295028 High Drywell Temperature / 5					R	Ability to determine and/or interpret the Drywell pressure as it applies to HIGH DRYWELL TEMPERATURE : (CFR: 41.10 / 43.5 / 45.13) (EA2.04 – RO)	4.1 (RO)	15R
					S	Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13) (2.4.6 – SRO)	4.7 (SRO)	5S
295030 Low Suppression Pool Wtr Lvl / 5					R	Ability to determine and/or interpret the Suppression pool temperature as it applies to LOW SUPPRESSION POOL WATER LEVEL : (CFR: 41.10 / 43.5 / 45.13) (EA2.02)	3.9	16R
295031 Reactor Low Water Level / 2					R	Ability to operate and/or monitor low pressure core spray as it applies to REACTOR LOW WATER LEVEL : (CFR: 41.7 / 45.6) (EA1.03 - RO)	4.4	17R
					S	Ability to determine and/or interpret adequate core cooling as it applies to REACTOR LOW WATER LEVEL : (CFR: 41.10 / 43.5 / 45.13) (EA2.04 – SRO)	4.8 (SRO)	6S
295037 SCRAM Condition Present and Power Above APRM Downscale	R					Knowledge of the operational implications of the reactor pressure effects on reactor power as it	4.1	18R

or Unknown / 1								applies to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: (CFR: 41.8 to 41.10) (EK1.01)		
295038 High Off-site Release Rate / 9			R					Knowledge of the reasons for emergency depressurization as it applies to HIGH OFF-SITE RELEASE RATE: (CFR: 41.5 / 45.6) (EK3.04)	3.6	19R
600000 Plant Fire On Site / 8			R					Knowledge of the reasons for actions contained in the abnormal procedure for plant fire on site as it applies to PLANT FIRE ON SITE: (AK3.04 - RO)	2.8 (RO)	20R
							S	Ability to identify post-accident instrumentation. (CFR: 41.6 / 45.4) (2.4.3 - SRO) (REJECTED)	4.4 (SRO)	7S
								Knowledge of the emergency plan. (CFR: 43.5) (2.4.29 - SRO)		
K/A Category Totals:	3	3	3	4	3	4	R	R	Group Point Total:	20/7
					3	4	S	S		

High Radiation / 9										
295035 Secondary Containment High Differential Pressure / 5										
295036 Secondary Containment High Sump/Area Water Level / 5										
500000 High CTMT Hydrogen Conc. / 5						R		Ability to determine and / or interpret the Hydrogen monitoring system availability as it applies to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS: (CFR: 41.10 / 43.5 / 45.13) (EA2.01)	3. 1	27R
K/A Category Point Totals:	1	1	1	1	2	1		Group Point Total:		7/3
					R	R				
					2	1				
					S	S				

ES-401BWR Examination Outline														Form ES-401-1													
														Plant Systems - Tier 2/Group 1 (RO / SRO)													
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#													
203000 RHR/LPCI: Injection Mode												R	Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc. (CFR: 41.10 / 45.1 / 45.12) (2.1.29)	4.1	28R												
205000 Shutdown Cooling			R									R	Knowledge of the effect that a loss or malfunction of the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) will have on reactor water level (plant-specific): (CFR: 41.7 / 45.4) (K3.02 – RO)	3.2(RO)	29R												
												S	Knowledge of procedures and limitations involved in core alterations. (CFR: 41.10 / 43.6 / 45.7) (2.1.36 - SRO)	4.1(SRO)	11S												
206000 HPCI																											
207000 Isolation (Emergency) Condenser																											
209001 LPCS												R	Knowledge of the process for conducting special or infrequent tests. (CFR: 41.10 / 43.3 / 45.13) (2.2.7)	2.9	30R												
209002 HPCS						R							Knowledge of the effect that a loss or malfunction of the Suppression pool suction strainer (BWR-5,6) will have on the HIGH PRESSURE CORE SPRAY SYSTEM (HPCS): (CFR: 41.7 / 45.7) (K6.04)	2.5	31R												
211000 SLC			R										Knowledge of the effect that a loss or malfunction of the STANDBY LIQUID CONTROL SYSTEM will have on the core spray line break detection system (plant-specific): (CFR: 41.7 / 45.4) (K3.02)	3.0	32R												
212000 RPS		R											Knowledge of electrical power supplies to the RPS motor-generator sets: (CFR: 41.7) (K2.01)	3.2	33R												
215003 IRM				R									Knowledge of INTERMEDIATE RANGE MONITOR (IRM) SYSTEM design feature(s) and/or interlocks which provide for the rod withdrawal blocks: (CFR: 41.7) (K4.01)	3.7	34R												
215004 Source Range Monitor						R							Knowledge of the effect that a loss or malfunction of the RPS will have on the SOURCE RANGE MONITOR (SRH) SYSTEM : (CFR: 41.7 / 45.7) (K6.01 – RO)	3.2(RO)	35R												

										S	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (CFR: 41.10 / 43.5 / 45.3) (2.4.50 – SRO) This KA was rejected Ability to diagnose and recognize trends in a timely manner utilizing the appropriate control room reference material. (CFR: 41.10 / 43.5 / 45.12). (G-2.4.47)	4.0 (SRO)	12S
215005 APRM / LPRM				R							Knowledge of the operational implications of Assignment of LPRM's to specific APRM channels as they apply to AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM : (CFR: 41.5 / 45.3) (K5.06)	2.5	36R
217000 RCIC		R									Knowledge of electrical power supplies to the gland seal compressor (vacuum pump): (CFR: 41.7) (K2.04) Knowledge of the effect that a loss or malfunction of the condensate storage and transfer system will have on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC): (CFR: 41.7 / 45.7) (K6.04)	2.6 3.5	37R 38R
218000 ADS	R									R	Knowledge of the physical connections and/or cause-effect relationships between AUTOMATIC DEPRESSURIZATION SYSTEM and the nuclear boiler instrument system: (CFR: 41.2 to 41.9 / 45.7 to 45.8) (K1.03) Ability to (a) predict the impacts of the Loss of A.C. or D.C. power to ADS valves on the AUTOMATIC DEPRESSURIZATION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) (A2.05)	3.7 3.4	39R 40R
223002 PCIS/Nuclear Steam Supply Shutoff										R	Ability to predict and/or monitor changes in parameters associated with operating the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF controls including valve closures: (CFR: 41.5 / 45.5) (A1.02 - RO) S Knowledge of less than or equal to one hour Technical Specification action statements for systems. (CFR: 41.7 / 41.10 / 43.2 / 45.13) (2.2.39 – SRO)	3.7(RO) 4.5(SRO)	41R 13S
239002 SRVs										R	Ability to (a) predict the impacts of the following on the RELIEF/SAFETY VALVES; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: ADS Actuation (CFR: 41.5 / 45.6) (A2.04)	4.1	42R

259002 Reactor Water Level Control									R	Ability to monitor automatic operations of the REACTOR WATER LEVEL CONTROL SYSTEM including runout flow control (plant-specific): (CFR: 41.7 / 45.7) (A3.01)	3.0	43R
261000 SGTS								R		Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM controls including system flow: (CFR: 41.5 / 45.5) (A1.01 - RO)	2.9 (RO)	44R
								S		Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High system pressure (plant-specific) (CFR: 41.5 / 45.6) (A2.14 – SRO)	3.2 (SRO)	14S
262001 AC Electrical Distribution							R			Knowledge of the operational implications of the following concepts as they apply to A.C. ELECTRICAL DISTRIBUTION: principle involved with paralleling two A.C. sources (CFR: 41.5 / 45.3) (K5.01)	3.1	45R
									R	Ability to manually operate and/or monitor in the control room: voltage, current, power, and frequency on A.C. buses (CFR: 41.7 / 45.5 to 45.8) (A4.05)	3.3	46R
262002 UPS (AC/DC)							R			Knowledge of UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) design feature(s) and/or interlocks which provide for the following: transfer from preferred power to alternate power supplies (CFR: 41.7) (K4.01)	3.1	47R
									R	Ability to manually operate and/or monitor in the control room: transfer from alternative source to preferred source (CFR: 41.7 / 45.5 to 45.8) (A4.01)	2.8	48R
263000 DC Electrical Distribution	R									Knowledge of the physical connections and/or cause-effect relationships between D.C. ELECTRICAL DISTRIBUTION and Battery charger and battery: (CFR: 41.2 to 41.9 / 45.7 to 45.8) (K1.02 – RO)	3.2 (RO)	49R
									S	Ability to (a) predict the impacts of Grounds on the D.C. ELECTRICAL DISTRIBUTION; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) (A2.01 – SRO)	3.2 (SRO)	15S

ES-401BWR Examination OutlineForm ES-401-1														
Plant Systems - Tier 2/Group 2 (RO / SRO)														
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
201001 CRD Hydraulic											R	Ability to manually operate and/or monitor the SDV isolation valve test switch in the control room: (CFR: 41.7 / 45.5 to 45.8) (A4.06)	2.8	54R
201002 RMCS														
201003 Control Rod and Drive Mechanism	R											Knowledge of the physical connections and/or cause-effect relationships between CONTROL ROD AND DRIVE MECHANISM and the control rod drive hydraulic system: (CFR: 41.2 to 41.9 / 45.7 to 45.8) (K1.01)	3.2	55R
201004 RSCS														
201005 RCIS											R	Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions. (CFR: 41.5 / 43.5 / 45.12) (2.2.44)	4.2	56R
201006 RWM														
202001 Recirculation						R						Knowledge of the effect that a loss or malfunction of the Control rod drive system (plant-specific) will have on the RECIRCULATION SYSTEM : (CFR: 41.7 / 45.7) (K6.05)	2.7	57R
202002 Recirculation Flow Control								S				Ability to (a) predict the impacts of the following on the RECIRCULATION FLOW CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Recirculation pump speed mismatch between loops. (CFR 41.5 / 45.6) (A2.04)		16S
204000 RWCU														
214000 RPIS														
215001 Traversing In-core Probe								S						
215002 RBM														
216000 Nuclear Boiler Inst.							R					Ability to predict and/or monitor changes in parameters associated with operating the NUCLEAR BOILER INSTRUMENTATION controls including recorders and meters: (CFR: 41.5 / 45.5) (A1.01)	3.4	58R

219000 RHR/LPCI: Torus/Pool Cooling Mode														
223001 Primary CTMT and Aux.										S		Ability to (a) predict the impacts of the Compressor trips (loss of air) (plant-specific) on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) (A2.08)	3.1	17S
226001 RHR/LPCI: CTMT Spray Mode											R	Knowledge of RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE design feature(s) and/or interlocks which provide for pump minimum flow protection: (CFR: 41.7) (K4.05)	2.5	59R
230000 RHR/LPCI: Torus/Pool Spray Mode														
233000 Fuel Pool Cooling/Cleanup												S Knowledge of new and spent fuel movement procedures. (CFR: 41.10 / 43.7 / 45.13) (2.1.42)	3.4	18S
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam														
239003 MSIV Leakage Control														
241000 Reactor/Turbine Pressure Regulator											R	Knowledge of the operational Implications of turbine inlet pressure vs. reactor pressure as they apply to REACTOR/TURBINE PRESSURE REGULATING SYSTEM: (CFR: 41.5 / 45.3) (K5.04)	3.3	60R
245000 Main Turbine Gen. / Aux.											R	Knowledge of the physical connections and/or cause-effect relationships between MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS and the D. C. electrical distribution: (CFR: 41.2 to 41.9 / 45.7 to 45.8) (K1.09)	2.7	61R
256000 Reactor Condensate												R Ability to monitor automatic operations of the REACTOR CONDENSATE SYSTEM including pump starts: (CFR: 41.7 / 45.7) (A3.02)	3.0	62R
259001 Reactor Feedwater												R Ability to (a) predict the impacts of following on the REACTOR FEEDWATER SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of Extraction Steam (CFR: 41.5 / 45.6) (A2.04)	3.3	63R
268000 Radwaste														
271000 Offgas														

272000 Radiation Monitoring				R																Knowledge of RADIATION MONITORING System design feature(s) and/or interlocks which provide for redundancy: (CFR: 41.7) (K4.01)	2.7	64R	
286000 Fire Protection				R																Knowledge of the effect that a loss or malfunction of the FIRE PROTECTION SYSTEM will have on personnel protection: (CFR: 41.7 / 45.4) (K3.02)	3.2	65R	
288000 Plant Ventilation																							
290001 Secondary CTMT																							
290003 Control Room HVAC																							
290002 Reactor Vessel Internals																							
K/A Category Point Totals:	1	1	1	2	1	1	1	1	R	2	S	1	1	1	1	1	1	1	1	Group Point Total:		12/3	

Facility: Grand Gulf		Date of Exam: 2009				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.13	Knowledge of facility requirements for controlling vital/controlled access. (CFR: 41.10 / 43.5 / 45.9 / 45.10)	2.5	66R		
	2.1.17	Ability to make accurate, clear, and concise verbal reports. (CFR: 41.10 / 45.12 / 45.13)	3.9	67R		
	2.1.39	Knowledge of conservative decision making practices. (CFR: 41.10 / 43.5 / 45.12)	3.6	68R		
	2.1.5 (S)	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. (CFR: 41.10 / 43.5 / 45.12)			3.9	19S
	2.1.23 (S)	Ability to perform specific system and integrated plant procedures during all modes of plant operation. (CFR: 41.10 / 43.5 / 45.2 / 45.6)			4.4	20S
	2.1.30 (S)	Ability to locate and operate components, including local controls. (CFR: 41.7 / 45.7)			4.0	21S
	Subtotal			3		3
2. Equipment Control	2.2.18	Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc. (CFR: 41.10 / 43.5 / 45.13)	2.6	69R		
	2.2.37	Ability to determine operability and/or availability of safety related equipment. (CFR: 41.7 / 43.5 / 45.12)	3.6	70R		
	2.2.44	Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions. (CFR: 41.5 / 43.5 / 45.12)	4.2	71R		
	2.2.25 (S)	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits. (CFR: 41.5 / 41.7 / 43.2)			4.2	22S
	2.2.42 (S)	Ability to recognize system parameters that are entry-level conditions for Technical Specifications. (CFR: 41.7 / 41.10 / 43.2 / 43.3 / 45.3)			4.6	23S
	Subtotal			3		2
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions. (CFR: 41.12 / 43.4 / 45.10)	3.2	72R		
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (CFR: 41.12 / 43.4 / 45.10)	3.4	73R		
	2.3.11 (S)	Ability to control radiation releases. (CFR: 41.11 / 43.4 / 45.10)			4.3	24S
	Subtotal			2		1
	2.4.13	Knowledge of crew roles and responsibilities during EOP usage. (CFR: 41.10 / 45.12)	4.0	74R		

4. Emergency Procedures / Plan	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc. (CFR: 41.7 / 43.5 / 45.12)	4.0	75R		
	2.4.37 (S)	Knowledge of the lines of authority during implementation of the emergency plan. (CFR: 41.10 / 45.13)			4.1	25S
	Subtotal			2		1
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
2/1	206000 HPCI	This exam is being written for the BWR-6 design. This question is only applicable to the BWR-2, -3, and -4 designs.
2/1	207000 Isolation (Emergency) Condenser	This exam is being written for the BWR-6 design. This question is only applicable to the BWR-2 and -3 designs.
2/1	261000 SGTS	This exam is being written for a BWR-6 design, which includes Mark-III containment. The line item selected (A1.06) is specific for Mark-I containment.
1/1	295024 High Drywell Pressure	The original random selection of EA1.16 involves containment/drywell vacuum breakers, and this plant does not include these. Drywell vacuum relief is provided for in the CGCS, but physical passive vacuum breakers are not included.
1/1	295028 High Drywell Temperature	This exam is being written for a BWR-6 design, which includes Mark-III containment. The line item selected (EA2.06) is specific for Mark-I containment.
2/2	230000 RHR/LPCI: Torus/Pool Spray Mode	This exam is being written for a BWR-6 design, which includes Mark-III containment. The system selected is specific for Mark-I containment.
2/1	263000 DC Electrical Distribution	For the selected item for an RO question (K1.03), it will be difficult to develop valid discriminatory answers.
3	G 2.1.30	A valid SRO question could not be developed for this KA. (Ability to locate and operate components, including local controls.) Another KA was randomly selected.
2/2	215001 A2.01	This KA was rejected due to it not being applicable to a Mark III containment. Another KA was randomly selected.
1/1	295028 G-2.4.18	This KA was rejected due to the fact that this was selected for a SRO question, and EOP bases knowledge is applicable to RO questions. Another generic Emergency Procedures/Plan KA was selected for the Safety Function.
1/1	295023 AA2.03	A valid SRO question could not be developed for this KA. Another safety function was selected, and a KA was randomly selected.
2/1	215004 G-2.4.50	This KA was rejected due to it being focused on actions found in the alarm cards making it an RO question. Another

Facility: Grand Gulf Nuclear Station		Date of Examination: 2 March 2009
Examination Level (circle one) RO / SRO		Operating Test Number:
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N	Perform Daily Operations Log Surveillance for SLC Operability. GJPM-OPS-ADM04 K/A 2.1.25: 2.8
Conduct of Operations		N/A
Equipment Control	N	Prepare a Tagout Tags Sheet for a Protective Tag out Clearance. GJPM-OPS-ADM01 K/A 2.2.13: 3.6
Radiation Control	M	Identify Entry/Exit Requirements for accessing a High Radiation Area / Contamination Area. GJPM-OPS-RP01 K/A 2.3.1: 2.6; 2.3.4: 2.5
Emergency Procedures/Plan	N	Loss of Shutdown Cooling - Determine time to 200°F GJPM-OPS-ADM03 K/A 2.4.11 3.4
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C) ontrol Room (D) irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N) ew or (M) odified from bank (≥ 1) (P) revious 2 exams (≤ 1 ; randomly selected) (S) imulator		

Facility: Grand Gulf Nuclear Station		Date of Examination: 2 March 2009
Examination Level (circle one) RO (SRO)		Operating Test Number:
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N	Perform SRO review of the Daily Jet Pump Surveillance. GJPM-SRO-ADM01 K/A 2.1.33: 4.0
Conduct of Operations	M	Review the Plant Chemistry Report and determine any required actions GJPM-SRO-ADM03 K/A 2.1.25: 3.1; 2.1.34: 2.9
Equipment Control	N	Perform Tag Reviewer review of Protective Tag out Clearance. GJPM-OPS-ADM02 K/A 2.2.13: 3.8
Radiation Control	M	Review Liquid Radwaste Discharge Permit. GJPM-SRO-ADM02 K/A 2.3.6: 3.1
Emergency Procedures/Plan	M	Given plant conditions, determine entry into the Site Emergency Plan and complete the initial notification form. ATWS GJPM-OPS-EAL25 K/A 2.4.41: 4.1; 2.4.38: 4.0; 2.4.40: 4.0
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C) ontrol Room (D) irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N) ew or (M) odified from bank (≥ 1) (P) revious 2 exams (≤ 1 ; randomly selected) (S) imulator		

Facility: Grand Gulf Nuclear Station		Date of Examination: 2 March 2009
Exam Level (circle one) RO / SRO-I / SRO-U		Operating Test Number:
Control Room Systems [@] (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. 202001 <u>Recirculation System</u> - Startup idle Recirculation Pump w/ High Vibration requiring manual pump trip.	S; N; A; L	1
b. 209002 <u>High Pressure Core Spray System</u> – Operate HPCS in CST-to-CST mode w/failure of HPCS minimum flow valve	S; D; A	2 ESF
c. 264000 <u>Emergency Generators</u> – Parallel of Emergency Generator (with load) to the grid	S; N	6 ESF
d. 400000 <u>Component Cooling Water System</u> – Rotate CCW pumps w/CCW pump trip	S; B; A	8
e. 217000 <u>Reactor Core Isolation Cooling System</u> – Operate RCIC for RPV pressure control w/failure of RCIC turbine speed controller	S; N; A	3
f. 219000 <u>RHR/LPCI: Suppression Pool Cooling Mode</u> – Secure RHR from Containment Spray mode to Suppression Pool Cooling mode w/trip of ECCS pump requiring manual RHR alignment to LPCI mode	S; N; A	5 ESF
g. 201005 <u>Rod Control and Information System</u> – Bypass a Control Rod in the RACS	C; D	7
h. 239003 <u>Main Steam Isolation Valve Leakage Control System</u> – Start the Outboard MSIV LCS w/ blower failure requiring start of the Inboard MSIV LCS	C; N; A	9 ESF
In-Plant Systems [@] (3 for RO; 3 for SRO-I; 3or2 for SRO-U)		
i. 211000 <u>Standby Liquid Control System</u> – Perform SLC Pump A Monthly Surveillance	R; N	1
j. 262002 <u>Uninterruptible Power Supply (A.C./D.C.)</u> – Start up Static Inverter 1Y81	D	6
k. 286000 <u>Fire Protection System</u> – Align Fire Water for injection to the reactor via LPCS and RHR C per EP Attachment 26	R; E; L; D	8
<p>[@] All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path	4-6 / 4-6 / 2-3	
(C)ontrol Room		
(D)irect from bank	≤9 / ≤8 / ≤4	
(E)mergency or abnormal in-plant	≥1 / ≥1 / ≥1	
(L)ow-Power	≥1 / ≥1 / ≥1	
(N)ew or (M)odified from bank including 1(A)	≥2 / ≥2 / ≥1	
(P)revious 2 exams	≤3 / ≤3 / ≤2 (randomly selected)	
(R)CA	≥1 / ≥1 / ≥1	
(S)imulator		

Facility: Grand Gulf Nuclear Station		Date of Examination: 2 March 2009
Exam Level (circle one) RO / SRO-I / SRO-U		Operating Test Number:
Control Room Systems [@] (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. 202001 <u>Recirculation System</u> - Startup idle Recirculation Pump w/ High Vibration requiring manual pump trip.	S; N; A; L	1
b. 209002 <u>High Pressure Core Spray System</u> – Operate HPCS in CST-to-CST mode w/failure of HPCS minimum flow valve	S; D; A	2 ESF
c. 264000 <u>Emergency Generators</u> – Parallel of Emergency Generator (with load) to the grid	S; N	6 ESF
d. 400000 <u>Component Cooling Water System</u> – Rotate CCW pumps w/CCW pump trip	S; B; A	8
e. 217000 <u>Reactor Core Isolation Cooling System</u> – Operate RCIC for RPV pressure control w/failure of RCIC turbine speed controller	S; N; A	3
f. 219000 <u>RHR/LPCI: Suppression Pool Cooling Mode</u> – Secure RHR from Containment Spray mode to Suppression Pool Cooling mode w/trip of ECCS pump requiring manual RHR alignment to LPCI mode	S; N; A	5 ESF
g. 201005 <u>Rod Control and Information System</u> – Bypass a Control Rod in the RACS	C; D	7
h. N/A		
In-Plant Systems [@] (3 for RO; 3 for SRO-I; 3or2 for SRO-U)		
i. 211000 <u>Standby Liquid Control System</u> – Perform SLC Pump A Monthly Surveillance	R; N	1
j. 262002 <u>Uninterruptible Power Supply (A.C./D.C.)</u> – Start up Static Inverter 1Y81	D	6
k. 286000 <u>Fire Protection System</u> – Align Fire Water for injection to the reactor via LPCS and RHR C per EP Attachment 26	R; E; L; D	8
<p>[@] All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path	4-6 / 4-6 / 2-3	
(C)ontrol Room		
(D)irect from bank	≤9 / ≤8 / ≤4	
(E)mergency or abnormal in-plant	≥1 / ≥1 / ≥1	
(L)ow-Power	≥1 / ≥1 / ≥1	
(N)ew or (M)odified from bank including 1(A)	≥2 / ≥2 / ≥1	
(P)revious 2 exams	≤3 / ≤3 / ≤2 (randomly selected)	
(R)CA	≥1 / ≥1 / ≥1	
(S)imulator		

Facility: Grand Gulf Nuclear Station		Date of Examination: 2 March 2009
Exam Level (circle one) RO / SRO-I / SRO-U		Operating Test Number:
Control Room Systems[@] (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. N/A		
b. N/A		
c. N/A		
d. N/A		
e. 217000 <u>Reactor Core Isolation Cooling System</u> – Operate RCIC for RPV pressure control w/failure of RCIC turbine speed controller	S; N; A	3
f. 219000 <u>RHR/LPCI: Suppression Pool Cooling Mode</u> – Secure RHR from Containment Spray mode to Suppression Pool Cooling mode w/trip of ECCS pump requiring manual RHR alignment to LPCI mode	S; N; A	5 ESF
g. N/A		
h. N/A		
In-Plant Systems[@] (3 for RO; 3 for SRO-I; 3or2 for SRO-U)		
i. 211000 <u>Standby Liquid Control System</u> – Perform SLC Pump A Monthly Surveillance	R; N	1
j. 262002 <u>Uninterruptible Power Supply (A.C./D.C.)</u> – Start up Static Inverter 1Y81	D	6
k. 286000 <u>Fire Protection System</u> – Align Fire Water for injection to the reactor via LPCS and RHR C per EP Attachment 26	R; E; L; D	8
<p>[@] All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path	4-6 / 4-6 / 2-3	
(C)ontrol Room		
(D)irect from bank	≤9 / ≤8 / ≤4	
(E)mergency or abnormal in-plant	≥1 / ≥1 / ≥1	
(L)ow-Power	≥1 / ≥1 / ≥1	
(N)ew or (M)odified from bank including 1(A)	≥2 / ≥2 / ≥1	
(P)revious 2 exams	≤3 / ≤3 / ≤2 (randomly selected)	
(R)CA	≥1 / ≥1 / ≥1	
(S)imulator		

Facility: **GRAND GULF NUCLEAR STATION** Scenario No.: **1** Op-Test No.: **030209**

Examiners: _____ Operators: _____

Objectives: To evaluate the candidates' ability to operate the facility in response to the following evolutions:

1. Rotate EHC pumps.
2. Recognize and respond to indications of a Seal Steam Pressure Controller failure.
3. Respond to RPS MG Set B trip.
4. Recognize and respond to Reactor Recirc Flow Control Valve A failing open.
5. Respond to bus 16AB lockout.
6. Respond to an ATWS.
7. Respond to a SSW C Pump trip.

Initial Conditions: Reactor Power is at 73 %.

INOPERABLE Equipment

None

Turnover:

The plant is at 73% power during startup. Power ascension is temporarily suspended to place EHC pump C in service and remove EHC pump A from operation in accordance with SOI 04-1-01-N32-1. No out of service equipment and EOOS is green. Division 1 work week is in effect.

Event No.	Malf. No.	Event Type*	Event Description
1		N(BOP)	Rotate EHC pumps - start C and secure A (SOI 04-1-01-N32-1 section 5.1)
2	ms255	C(ACRO)	Recognize and respond to indications of a Seal Steam Pressure Controller failure. (ARI 1H13-P680-10A-E7)
3	c71077b	C(ACRO)	Respond to RPS MG Set B trip (05-1-02-III-2)
4	di_1b33k603ac	C(ACRO)	Recognize and respond to Recirc FCV A Controller Failure (FCV Opens)
5	r21139f	C(BOP)	Respond to ESF bus 16AB lockout (ONEP 05-1-02-I-4)
6	c11164 @ 10	M (ALL)	Respond to an ATWS (EP-2A)
7	p41149	C(BOP)	Respond to SSW C Pump trip

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

Critical Tasks

- Upon recognition of ATWS conditions, perform actions to insert control rods by scrambling and/or driving.
- When conditions are met in EP-2A, terminate and prevent injection to exercise power/level control, and re-establish injection to control RPV level in accordance with EP-2A.

Facility: **GRAND GULF NUCLEAR STATION** Scenario No.: **2** Op-Test No.: **030209**

Examiners: _____ Operators: _____

Objectives: To evaluate the candidates' ability to operate the facility in response to the following evolutions:

1. Raise reactor power from 81% to 88% using Recirc FCVs.
2. Recognize and respond to a low failure of APRM B Flow Reference Signal resulting in an APRM B Upscale.
3. Recognize and respond to Reactor Feed Pump B Controller failure – increasing speed.
4. Respond to an SRV failing open.
5. Recognize and respond to failure of HPCS suction to automatically align to Suppression Pool on high Suppression Pool level.
6. Respond to bus 12HE lockout.
7. Respond to trip of Service Transformer 11.
8. Respond to a RCIC steam line break in the RCIC room with failure/inability to isolate.

Initial Conditions: Reactor Power is at 81 %.

INOPERABLE Equipment

None

Turnover:

The plant is at 81% power following a temporary downpower for a control rod pattern adjustment. Power ascension is to continue to 88% where it will be held due to fuel preconditioning limitations. The current envelope is at 90% power. There is no out of service equipment. EOOS is green. A Division 1 work week is in effect.

Event No.	Malf. No.	Event Type*	Event Description
1		R(ACRO)	Raise reactor power from 81% to 88% using Recirc FCVs (03-1-01-2)
2	aprm bus	C(ACRO)	APRM B Flow Reference Signal Failure Low – APRM Upscale (ARI 04-1-021H13-P680-5A-B10)
3	fw121b	C(ACRO)	Reactor Feed Pump B Controller failure – increasing speed (05-1-02-V-7)
4	di_1b21606d	C(BOP)	Respond to an SRV B21-F041D failing open (EP-3)
5	Att 4	C(BOP)	Respond to failure of HPCS suction to automatically align to Suppression Pool on high Suppression Pool level (ARI 1H13-P601-16A-C5)
6	r21138b	C(ACRO)	Respond to bus 12HE lockout (ONEP 05-1-02-I-4)
7	r21133a	M (ALL)	Respond to trip of Service Transformer 11 (ONEP 05-1-02-I-4, EP-2)
8	e51050 e51187a e51187b	M (ALL)	Respond to a RCIC steam line break in the RCIC room with failure/inability to isolate (EP-4)

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

Critical Tasks

- When Maximum Safe temperature is reached in RCIC Room and auxiliary building Steam Tunnel, enters the Emergency Depressurization leg of EP-2 and opens at least 7 SRVs.
- During Emergency Depressurization, maintains reactor water level above -192" Compensated Fuel Zone using Condensate system.