BWR SRO EXAMINATION OUTLINE

Facility: **GRAND GULF NUCLEAR STATION** Date of Exam: **18 DECEMBER 2000**

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	5	5	3				4	6			3	26
	2	3	3	5				4	1			1	17
	TIER TOTAL	8	8	8				8	7			4	43
2. Plant Systems	1	1	1	2	2	1	3	5	1	1	5	1	23
	2	2	2	1	2	0	1	0	1	1	2	1	13
	3	1	0	0	0	1	0	0	2	0	0	0	4
	TIER TOTAL	4	3	3	4	2	4	5	4	2	7	2	40

3. Generic Knowledge & Abilities	CAT 1	CAT 2	CAT 3	CAT 4	
	5	4	2	6	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 K/A category shall not be less than two)
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 they relate to plant specific priorities.
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 relevant to the applicable evolution or system.
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 justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.

BWR SRO EXAMINATION OUTLINE
EMERGENCY & ABNORMAL PLANT
EVOLUTIONS - TIER 1 GROUP 1

E/APE #/NAME/SAFETY FUNCTION	K 1	K 2	K 3	A 1	A 2	G	TOPIC(S)	IMP	REC #	SRO/RO /BOTH	RELATED K/A	ORIGIN	NOTES:
295003 Partial or Complete Loss of AC Power/ 6 CFR41.7					05		Given plant conditions, a normal electrical line up, and a loss of power, determine the availability of safe shutdown systems and buses.	4.2	205	BOTH	AA1.03: 4.4	BANK NRC 5/00	
295006 SCRAM / 1 CFR41.5/41.14		02					Describe the response of the Reactor Water Level Control System when reactor level reaches level 3, during a reactor scram.	3.8	274	BOTH	259002 K4.04: 2.9 A3.06: 3.0	BANK NRC 5/00	
295007 High Reactor Pressure / 3 CFR41.1/41.7					02		With the reactor operating at 100% power, describe the effects on the reactor, if a MSIV isolates.	4.1	201	BOTH	AA2.03: 3.7	BANK NRC 5/00	Reactor power and reactor level inside shroud
295009 Low Reactor Water Level / 2 CFR41.7				02			Describe the reaction of the Reactor Water Level Control System to a failure of a Feedwater Flow Transmitter to an upscale value.	4.0	68	BOTH	AA2.02: 3.7 259002 K6.04: 3.1	BANK NRC 3/98	Digital Feed Control System
295010 High Drywell Pressure / 5 CFR41.4/41.9	02						Describe the implications with regard to Drywell Pressure with Suppression Pool level out of specification (high).	3.1		BOTH			
295013 High Suppression Pool Water Temp. / 5 CFR41.9				02			Given plant conditions, determine the cause for rising Suppression Pool temperature.	3.9	211	BOTH		BANK NRC 5/00	
295014 Inadvertent Reactivity Addition / 1 CFR41.6/41.14/43.6					04		Identify thermal limit compliance following a slow opening of a single Recirc Flow Control Valve.	4.4	106	BOTH	AK1.05: 4.2 AK2.02: 4.2 AA2.05: 4.6	BANK NRC 3/98	
295015 Incomplete SCRAM / 1 CFR41.1/41.8/43.6	01						Identify the conditions in which the reactor can be considered shutdown, in the event of an incomplete SCRAM.	3.9	33	BOTH		BANK NRC 3/98	
295016 Control Room Abandonment / 7 CFR41.7		01					Describe the impact and reason for having two switches for E12-F042A/B, LPCI Injection Valves.	4.5	29	BOTH		BANK NRC 3/98	
295017 High Offsite Release Rate / 9 CFR41.10/43.5		06					Given plant conditions and EPPs, determine protective action recommendations per Site Emergency Plan.	4.6	112	BOTH		BANK NRC 3/98	Relates release to actions to protect the public.
295023 Refueling Accidents / 8 CFR41.2/41.10/41.12/43.4/43.5/43.6/43.7			01				Describe Refueling Floor personnel response to a fuel handling accident.	4.3	208	BOTH		BANK NRC 5/00	
295024 High Drywell Pressure / 5 CFR41.9	01						Describe the implications of exceeding the Drywell maximum design pressure.	4.2	259	BOTH		BANK NRC 5/00	
PAGE 1 TOTAL TIER 1 GROUP 1	3	3	1	2	3	0	PAGE TOTAL # QUESTIONS	12					

E/APE #/NAME/SAFETY FUNCTION	K 1	K 2	K 3	A 1	A 2	G	TOPIC(S)	IMP	REC #	SRO/RO /BOTH	RELATED K/A	ORIGIN	NOTES:
295025 High Reactor Pressure / 3 CFR41.3/43.2						2. 2. 22	State the Reactor Vessel pressure Safety Limit and its basis.	4.1	30	BOTH	EK1.05: 4.7 2.2.25: 3.7 EK1.02: 4.2	BANK NRC 3/98	①Moved from random A2 to Generics
295026 Suppression Pool High Water Temp. / 5 CFR41.7/41.9/41.10/41.14/43.5		01					Given plant conditions, determine when Suppression Pool cooling is no longer effective and alternate actions are required.	4.0	301	BOTH		MOD NRC 5/00	
295027 High Containment Temperature / 5 CFR41.9/41.10/43.5				03			Determine the Containment Temperature at which Emergency Depressurization is required.	3.8	65	BOTH		BANK NRC 3/98	
295030 Low Suppression Pool Water Level / 5 CFR41.9	01						Identify the minimum level to ensure steam condensation from Safety Relief Valve actuation.	4.1		BOTH			
295031 Reactor Low Water Level / 2 CFR41.2/41.3/41.10/43.5						2. 4. 21	Given plant conditions and a low reactor water level, determine core cooling mechanism and adequacy.	4.3		BOTH	EK1.01: 4.7 2.1.1: 3.8		②Moved from random A2 to Generics
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1 CFR41.10/41.14/43.5					07		Given plant conditions, determine actions to be taken in the event of an ATWS and degrading containment conditions.	4.2		BOTH			
295038 High Offsite Release Rate / 9 CFR41.13/43.4		03					Describe the means of limiting offsite radiation releases utilizing plant ventilation systems.	3.8	57	**SRO**	EA1.06: 3.6	BANK NRC 3/98	
500000 High Containment Hydrogen Conc. / 5 CFR41.10/43.5						2. 4. 6	Given conditions in Containment and Drywell, determine means of Hydrogen control following LOCA conditions.	4.0		BOTH	2.1.25: 3.1 2.4.48: 3.8 EA1.03: 3.2		③Moved from random A2 to Generics
295007 High Reactor Pressure / 3 CFR41.5/43.2	03						Given a Grid load loss, describe the effects of rising reactor pressure on reactor power.	3.9		**SRO**			GGNS reactor scram 9/00
PAGE 2 TOTAL TIER 1 GROUP 1	2	2	0	1	1	3	PAGE TOTAL # QUESTIONS	9					

① 295025 Moved from random selection A2 to Generics.
② 295031 Moved from random selection A2 to Generics.
③ 500000 Moved from random selection A2 to Generics

E/APE #/NAME/SAFETY FUNCTION	K 1	K 2	K 3	A 1	A 2	G	TOPIC(S)	IMP	REC #	SRO/RO /BOTH	RELATED K/A	ORIGIN	NOTES:
295003 Partial or Complete Loss of AC Power / 6 CFR41.7			01				Given a momentary degraded grid voltage condition, determine the affects on the ESF buses and power supplies.	3.5		SRO	AK3.03: 3.6 AK1.03: 3.2 AK1.04: 3.2	MOD	Grid fault 9/00 INPO SOER 99-1
295014 Inadvertent Reactivity Addition / 1 CFR41.1/41.5				07			During a reactor startup, determine the effects of level control malfunctions on core reactivity.	4.1		SRO			
295015 Incomplete SCRAM / 1 CFR41.2/41.6					02		Describe means to obtain indication of a control rod which is stuck at an odd reed switch position in the core following a reactor scram.	4.2		SRO			
295026 Suppression Pool High Water Temp. / 5 CFR41.7/41.9/41.10/41.14/43.5			05				Given plant conditions, identify actions to be taken and the bases. (For immediately shutting down the reactor for Suppression Pool temperature in excess of 110°F.)	4.1		SRO	2.1.11: 3.8 2.2.25: 3.7		
295023 Refueling Accidents / 8 CFR41.10/41.12/43.4/43.5/43.7					02		Describe indications of a lowering water level in the Upper Containment Pool, control room indications, and personnel response.	3.7		SRO			
PAGE 3 TOTAL TIER 1 GROUP 1	0	0	2	1	2	0	PAGE TOTAL # QUESTIONS	5					
PAGE 1 TOTAL TIER 1 GROUP 1	3	3	1	2	3	0	PAGE TOTAL # QUESTIONS	12					
PAGE 2 TOTAL TIER 1 GROUP 1	2	2	0	1	1	3	PAGE TOTAL # QUESTIONS	9					
K/A CATEGORY TOTALS:	5	5	3	4	6	3	TIER 1 GROUP 1 GROUP POINT TOTAL	26					

BWR SRO EXAMINATION OUTLINE
EMERGENCY & ABNORMAL PLANT
EVOLUTIONS - TIER 1 GROUP 2

E/APE #/NAME/SAFETY FUNCTION	K 1	K 2	K 3	A 1	A 2	G	TOPIC(S)	IMP	REC #	SRO/RO/ BOTH	RELATED K/A	ORIGIN	NOTES:
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 CFR41.10/41.5/43.5	02						Given plant conditions and the power to flow map, identify the operational region and any required actions.	3.5	303	BOTH	AA2.01: 3.8 2.4.4: 4.3 2.4.11: 3.6	NEW	
295002 Loss of Main Condenser Vacuum / 3 CFR41.4	03						Describe the effect on plant operation in the event of a reduction in Condenser vacuum at 100% power.	3.8	40	BOTH		BANK NRC 3/98	Multiple events in GGNS history
295004 Partial or Complete Loss of DC Power / 6 CFR41.7					04		Describe the effects of a loss of DC power on the actuation of ECCS systems.	3.3	223	BOTH		BANK NRC 5/00	
295005 Main Turbine Generator Trip / 3 CFR41.4/41.5/41.6			02				Describe the basis for a Recirc Pump downshift at the end of cycle with a Main Turbine trip and when it is in effect.	3.5	276	BOTH	202001 K4.13: 4.0 K5.05: 3.6	BANK NRC 5/00	GGNS Scram 9/00
295008 High Reactor Water Level / 2 CFR41.4/41.7/41.10/43.5				08			Identify conditions that would require RPV High Water Level isolations to be bypassed.(HPCS/RFP)	3.5		BOTH	AA1.06: 2.8		
295011 High Containment Temperature / 5 CFR41.4/41.9/41.10/43.5			01				Determine conditions requiring additional Containment cooling and means to provide the cooling.	3.9		BOTH			
295012 High Drywell Temperature / 5 CFR41.9		02					Given plant conditions, determine actions to be taken with Drywell temperature above 200°F and a Containment isolation signal present.	3.7		BOTH	AK2.01: 3.5	NEW	④Moved from random K1 to K2
295018 Partial or Complete Loss of CCW / 8 CFR41.4/41.10/43.5			03				Given a partial loss of Component Cooling Water, determine actions to be taken and their basis.	3.3		BOTH			
295019 Partial or Complete Loss of Inst. Air / 8 CFR41.4/41.13/43.4/43.5		06					With a loss of Instrument Air, determine the affects on the Offgas System.	2.9		BOTH			
295020 Inadvertent Cont. Isolation / 5 & 7 CFR41.9			02				Determine the affects on Containment pressure and temperature with an inadvertent isolation of the Main Steam Lines at power.	3.5		BOTH	AK3.03: 3.2		
295021 Loss of Shutdown Cooling / 4 CFR41.5/43.5						2. 4. 9	Determine an available method of Alternate decay heat removal.	3.9	226	BOTH	AA1.04: 3.7 AK3.02: 3.4 AK3.05: 3.8	MOD NRC 5/00	Mode 5 ⑤Moved from random K2 to Generics
PAGE 1 TOTAL TIER 1 GROUP 2	2	2	4	1	1	1	PAGE TOTAL # QUESTIONS	11					

④ 295012 Moved from random selection K1 to K2, due to change in Abnormal Operating Procedure adding caution.
⑤ 295021 Moved from random selection K2 to Generics.

E/APE #/NAME/SAFETY FUNCTION	K 1	K 2	K 3	A 1	A 2	G	TOPIC(S)	IMP	REC #	SRO/RO/ BOTH	RELATED K/A	ORIGIN	NOTES:
295022 Loss of CRD Pumps / 1 CFR41.5				04			Describe the affects on reactor water level during a reactor startup with minimal decay heat and a loss of CRD Pumps. (RWCU is lined up to blowdown to the main condenser to compensate for CRD flow.)	2.6	55	BOTH	AK2.04: 2.7 AK2.05: 2.5	BANK NRC 3/98	
295028 High Drywell Temperature / 5													
295029 High Suppression Pool Water Level / 5													
295032 High Secondary Containment Area Temperature / 5 CFR41.4/41.10/43.5		02					Given plant conditions, determine the operation of the Auxiliary Building Ventilation System.	3.7		BOTH	EK2.01: 3.6		
295033 High Secondary Containment Area Radiation Levels / 9 CFR41.11/41.12/43.4				01			Given an area radiation monitor alarming, determine the possible cause.	4.0		BOTH	EA2.03: 4.2		
295034 Secondary Containment Ventilation High Radiation / 9 CFR41.4/41.11/41.12/41.13/43.4	02						Given plant conditions and an offsite release of radiation from the Secondary Containment, determine monitoring methods.	4.4		BOTH			
295035 Secondary Containment High Differential Pressure / 5													
295036 Secondary Containment High Sump/Area Water Level / 5 CFR41.7/41.13/43.5				01			Given plant conditions and high-high Floor Drain Transfer tank levels, determine an alternate path for transferring water and the implications of this transfer.	3.3		BOTH			
600000 Plant Fire On Site / 8 CFR41.10/43.5			04				With a fire on site and news media involvement, determine if the incident is reportable to the NRC.	3.4	150	SRO		BANK NRC 3/98	
PAGE 2 TOTAL TIER 1 GROUP 2	1	1	1	3	0	0	PAGE TOTAL # QUESTIONS	6					
PAGE 1 TOTAL TIER 1 GROUP 2	2	2	4	1	1	1	PAGE TOTAL # QUESTIONS	11					
K/A CATEGORY TOTALS:	3	3	5	4	1	1	TIER 1 GROUP 2 GROUP POINT TOTAL	17					

SYSTEM #/NAME	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	TOPIC(S)	IMP	REC #	SRO/RO/ BOTH	RELATED K/A	ORIGIN	NOTES:
201005 RCIS CFR41.6/41.7										01		Describe the indications of a single Control Rod Scram.	3.7	14	BOTH		BANK NRC 3/98	
202002 Recirculation Flow Control CFR41.6/41.7			06									Describe the operation of the Recirc Flow Control Valves during a Flow Control Valve Runback when a HPU trips.	3.7		BOTH			⑥Moved from random K2 to K3
203000 RHR/LPCI: Injection Mode CFR41.7										01		State the basis for monitoring reactor pressure when aligning the RHR system for injection into the reactor in the LPCI mode.	4.1	60	BOTH	K1.17: 4.0 K4.02: 3.4 A3.01: 3.7 A3.08: 4.1 A4.08: 4.3	BANK NRC 3/98	Where is press. sensed on LPCI for ops of inj. Valve.
209001 LPCS CFR41.7/41.8						08						When the LPCS Jockey Pump trips, describe the actions to be taken with regard to the Low Pressure Core Spray System.	3.0		BOTH	K4.02: 3.2		
209002 HPCS CFR41.7/41.8		03										Describe the operation of HPCS following an initiation with a loss of AC power.	2.9	238	BOTH	K2.01: 3.3	BANK NRC 5/00	
211000 SLC CFR41.6/41.7				02								Describe the response of the SLC system when aligned for test tank operation with a SLC initiation signal.	3.2	239	BOTH	A2.06: 3.3 A2.07: 3.2	BANK NRC 5/00	CR at GGNS
212000 RPS CFR41.6							08					Identify the impact a Reactor Protection System actuation has on the Control Rod Drive Hydraulic System.	3.4	302	BOTH	A2.20: 4.2 K1.06: 3.6 201001 K1.07: 3.4	MOD NRC 3/98	
215004 Source Range Monitor CFR41.6/41.5							04					Describe the affects SRMs have on RCIS Rod Blocks when withdrawing SRM detectors from the core during a reactor startup.	3.5	71	BOTH	A3.04: 3.6 201005 K4.03: 3.5	BANK NRC 3/98	
PAGE 1 TOTAL TIER 2 GROUP 1	0	1	1	1	0	1	2	0	0	2	0	PAGE TOTAL # QUESTIONS	8					

⑥ 202002 Moved from random selection K2 to K3, due to low importance values of K2 topics.

SYSTEM #/NAME	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	TOPIC(S)	IMP	REC #	SRO/RO/ BOTH	RELATED K/A	ORIGIN	NOTES:
215005 APRM / LPRM CFR41.6/41.7						03						Determine the affects on APRMs with reduced LPRM inputs.	3.3		BOTH	A1.02: 4.0 A1.03: 3.6 A1.04: 4.1		
216000 Nuclear Boiler Instrumentation CFR41.7										01		Describe the inputs to the Post Accident RPV Level and Pressure Chart Recorders and actions that will identify changing plant parameters.	3.1		BOTH			
217000 RCIC CFR41.5/41.7/41.10							01					Given plant conditions, determine the operation of RCIC and indications of injection.	3.7		BOTH			
218000 ADS CFR41.5/41.7/41.8								01				Given plant conditions, determine the operation of ADS.	4.3	248	BOTH	K5.01: 3.8 K4.02: 4.0 K4.03: 4.0 A4.04: 4.1	BANK NRC5/00	
223001 Primary CTMT and Auxiliaries CFR41.5/41.7					01							Identify the purpose of relief devices installed in chilled water piping on the Containment side of Containment penetrations.	3.3		BOTH	2.1.28: 3.3		Design change
223002 PCIS / Nuclear Steam Supply Shutoff CFR41.7/41.9/41.10/43.5											2. 4. 49	Given isolation conditions, evaluate indications to determine whether appropriate actions have occurred.	4.0	270	BOTH	A1.01: 3.5 A2.01: 3.5 A3.01: 3.4 2.4.46: 3.6 2.4.48: 3.8	BANK NRC 5/00	
226001 RHR/LPCI: CTMT Spray Mode CFR41.5/41.9							02					Identify when Containment Spray is used and the response of Containment temperature.	3.5	304	BOTH		MOD NRC 5/00	
239002 SRVs CFR41.3	05											Describe the operation of the Safety Relief Valves in different modes of operation. (system air pressure or reactor pressure)	3.3		BOTH			
241000 Reactor / Turbine Pressure Regulator CFR41.5/41.7			02									Predict the impact on reactor pressure and heatup/cooldown if a Turbine Pressure input signal fails low during a reactor startup.	4.3		BOTH	K3.01: 4.1 K3.24: 3.2 K3.25: 3.3		
PAGE 2 TOTALS TIER 2 GROUP 1	1	0	1	0	1	1	2	1	0	1	1	PAGE 2 TOTAL # QUESTIONS	9					

SYSTEM #/NAME	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	TOPIC(S)	IMP	REC #	SRO/RO/ BOTH	RELATED K/A	ORIGIN	NOTES:
259002 Reactor Water Level Control CFR41.5							03					Describe the operation of the Feedwater Level Control System as reactor power is lowered.	3.8		BOTH	K4.09: 3.1 K4.10: 3.4		3-element vs 1 element
261000 SGTS CFR41.7/41.11										07		Determine the operation of the SGTS when placed in standby with sealed in initiation and system flow changes and building pressure changes.	3.2		BOTH	A2.01: 3.1 A3.02: 3.1		
262001 AC Electrical Distribution CFR41.4/41.7										03		Describe the indications for a circuit breaker returned to service following local maintenance.	3.4		BOTH	2.1.29: 3.3		SOER 98-2
264000 EDGs CFR41.8				02								Identify signals that will result in a loss of the Division I diesel generator when operating in response to a LOCA signal.	4.2		BOTH			
290001 Secondary CTMT CFR41.7/41.9						09						Describe the ability of Auxiliary Building Fire Protection system to be restored following an Auxiliary Building Isolation in conjunction with a loss of AC Power.	3.6	264	BOTH	A2.06: 4.0 286000 A2.09: 2.8	BANK NRC 5/00	
203000 RHR/LPCI: Injection Mode CFR41.7/41.10/43.5									01			A LOCA occurs with the plant aligned for shutdown cooling. Describe the alignment of RHR for LPCI operation.	3.7	272	BOTH	A3.08: 4.1 A4.02: 4.1 K4.01: 4.2	BANK NRC 5/00	Manual realignment requirement.
PAGE 3 TOTALS TIER 2 GROUP 1	0	0	0	1	0	1	1	0	1	2	0	PAGE TOTAL # QUESTIONS	6					
PAGE 1 TOTALS TIER 2 GROUP 1	0	1	1	1	0	1	2	0	0	2	0	PAGE TOTAL # QUESTIONS	8					
PAGE 2 TOTALS TIER 2 GROUP 1	1	0	1	0	1	1	2	1	0	1	1	PAGE TOTAL # QUESTIONS	9					
K/A CATEGORY TOTALS:	1	1	2	2	1	3	5	1	1	5	1	TIER 2 GROUP 1 GROUP POINT TOTAL	23					

SYSTEM #/NAME	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	TOPIC(S)	IMP	REC #	SRO/RO / BOTH	RELATED K/A	ORIGIN	NOTES:
201001 CRD Hydraulic CFR41.6/41.7								09				Recognize the effects of a loss of Instrument air on the operation of the Control Rod Drive Hydraulic System.	3.1		BOTH			
202001 Recirculation CFR41.5/41.6/43.6			08									Evaluate the effects of isolating the Recirculation System on the ability to operate Shutdown Cooling.	2.9		BOTH			
204000 RWCU CFR41.10/41.12/41.13/43.4/43.5											2. 1. 32	Determine the impact of excessive RWCU blowdown during reactor startup without a filter-demineralizer in service.	3.8		BOTH	A1.07: 2.9 2.3.10: 3.3		⑦ Moved from random A4 to Generic
205000 Shutdown Cooling CFR41.7/41.10/43.5				03								Describe the operation of the RHR Shutdown Cooling System in the event of a lowering reactor water level.	3.8	5	BOTH	A2.09: 3.8 A2.05: 3.7	BANK NRC 3/98	
215003 IRM																		
219000 RHR /LPCI Suppression Pool Cooling Mode																		
234000 Fuel Handling Equipment CFR41.4/43.7						03						Describe the interlocks between the Refueling Bridge and RC&IS that prevent movement of fuel in unacceptable conditions.	3.6	16	BOTH	A3.02: 3.7	BANK NRC 3/98	
239003 MSIV Leakage Control																		
245000 Main Turbine Gen., and Auxiliaries																		
259001 Reactor Feedwater CFR41.4/41.10/43.5									10			Determine system configuration following a Feed Pump trip on low lube oil pressure.	3.4		BOTH	A4.04: 2.9		
PAGE 1 TOTAL TIER 2 GROUP 2	0	0	1	1	0	1	0	1	1	0	1	PAGE TOTAL # QUESTIONS	6					

⑦ 204000 Moved from random selection A4 to Generic, identifies precaution associated with the system during startup operations.

SYSTEM #/NAME	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	TOPIC(S)	IMP	REC #	SRO/RO/ BOTH	RELATED K/A	ORIGIN	NOTES:
262002 UPS (AC/DC) CFR41.4/41.10/43.5	01											Determine the effect of a loss of UPS power on Reactor Water Level Control and Feedwater Systems.	3.0	292	BOTH	K1.02: 3.0	BANK NRC 5/00	INFI 90 CONTROL SYSTEM
263000 DC Electrical Distribution CFR41.4		01										Identify the power supply to the 250 volt DC bus.	3.4		BOTH			⑧ Moved random from A1 to K2
271000 Offgas CFR41.7/41.13	08											Determine the effects on the Offgas system with a loss of Oxygen injection to Offgas.	2.3		BOTH	K5.09: 2.8 K6.06: 2.5		⑨ HWC system installed
272000 Radiation Monitoring																		
286000 Fire Protection CFR41.4/41.7/41.10/43.5		02										Given a loss of offsite power, determine the affects on the Fire Protection System.	3.1		BOTH	K1.07: 2.9 K6.01: 3.1		
290003 Control Room HVAC CFR41.4/41.5/41.7										01		Given plant conditions, determine the appropriate Control Room HVAC configuration.	3.2	267	BOTH	A3.01: 3.5	BANK NRC 5/00	
300000 Instrument Air CFR41.4/41.10/43.5				02								Identify the means of providing air to the ADS valves for operation with an extended loss of Instrument Air.	3.0		BOTH			
400000 Component Cooling Water CFR41.4/41.7										01		Describe the operation of the CCW temperature controller when placing ADHR in service.	3.0		BOTH	K1.01: 3.3		
PAGE 2 TOTALS	2	2	0	1	0	0	0	0	0	2	0	PAGE 3 TOTAL # QUESTIONS	7					
PAGE 1 TOTALS	0	0	1	1	0	1	0	1	1	0	1	PAGE 1 TOTAL # QUESTIONS	6					
K/A CATEGORY TOTALS:	2	2	1	2	0	1	0	1	1	2	1	TIER 2 GROUP 2 GROUP POINT TOTAL	13					

⑧ 263000 Moved random selection from A1 to K2, A1 had one topic of battery discharge rates which has little discriminatory value.
⑨ 271000 HWC system installed with Oxygen injection to Offgas. This is an increased hazard to the plant with a sudden loss of oxygen injection.

BWR SRO EXAMINATION OUTLINE
PLANT SYSTEMS - TIER 2 GROUP 3

SYSTEM #/NAME	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	TOPIC(S)	IMP	REC #	SRO/RO/ BOTH	RELATED K/A	ORIGIN	NOTES:
201003 Control Rod and Drive Mechanism CFR41.6/41.10/43.5								08				Given conditions of the HCU, determine its status.	3.7		BOTH			©Original selection K2
215001 Traversing In-core Probe																		
233000 Fuel Pool Cooling and Cleanup																		
239001 Main and Reheat Steam																		
256000 Reactor Condensate CFR41.4/41.10/43.5	02											Given plant conditions, determine the affects on the Feedwater System with a single Condensate pump trip.	3.3		BOTH			
268000 Radwaste CFR41.13/41.10/43.4/43.5								01				Given a rupture in the Liquid Radwaste System, determine the actions to be taken.	3.5		BOTH	2.4.1: 4.6 2.4.11: 3.6		⑩ see below
288000 Plant Ventilation CFR41.1/41.5/41.7					02							Determine the method of maintaining Auxiliary Building (Secondary Containment) differential pressure during normal operation.	3.4		BOTH			⑩ see below
290002 Reactor Vessel Internals																		
K/A CATEGORY TOTALS:	1	0	0	0	1	0	0	2	0	0	0	TIER 2 GROUP 3 GROUP POINT TOTAL	4					

⑩ 268000 Random selection was K5 which has low discriminatory value, moved to category A2 that only had two topics. System 288000 random selection was A4 which had multiple topics in Tier 2, category K5 needed an additional topic. System 288000 topic was moved to category K5.
© 201003 Original selection K2, K2 for CRD Mechanism is NONE, moved to A2.

CATEGORY	C1	C2	C3	C4	TOPIC(S)	IMP	REC #	SRO/RO /BOTH	RELATED K/A	ORIGIN	NOTES:
CONDUCT OF OPERATIONS – Deviations from Approved documents in emergency conditions CFR41.10/43.3/43.5	2.1.1				Given plant conditions that require a deviation from procedures, describe the process and when this action can be taken.	3.8	135	SRO	2.1.2: 4.0	BANK NRC 3/98	50.54x
CONDUCT OF OPERATIONS – System lineups CFR41.10/43.2/43.5	2.1.29				Given plant conditions, determine when a complete system lineup is required.	3.3		SRO			
CONDUCT OF OPERATIONS – Chemistry Limits CFR41.10/43.2/43.5	2.1.34				Given Chemistry report, evaluate plant chemistry analysis against specifications and determine actions.	2.9	197	SRO		BANK NRC 5/00	
CONDUCT OF OPERATIONS – Tech Specs CFR43.2	2.1.12				Given Technical Specifications and plant conditions, apply actions for a given situation. (SLC concentrations and conditions)	4.0	185	SRO	2.1.10: 3.9	BANK NRC 5/00	
CONDUCT OF OPERATIONS – Responsibilities and Procedure usage CFR41.10	2.1.2				Given a situation that requires procedure changes to accomplish task, determine the actions to be taken.	4.0	196	SRO	2.1.20: 4.2 2.1.21: 3.2 2.1.23: 4.0	BANK NRC 5/00	
EQUIPMENT CONTROL – Core Loading Procedures & Limitations CFR43.6/43.7		2.2.31			Determine what is a Core Alteration.	2.9	108	SRO	2.2.34: 3.3	BANK NRC 3/98	
EQUIPMENT CONTROL – Tech Spec Bases CFR43.2		2.2.25			Given a value for Fraction of Core Boiling Boundary and plant conditions, evaluate the status of FCBB and its basis.	3.7		SRO	2.1.11: 3.8		
EQUIPMENT CONTROL – Maintenance Control CFR43.3/43.2		2.2.24			Evaluate the status of a Limiting Condition for Operation following maintenance on a system.	3.8		SRO			
EQUIPMENT CONTROL – Refueling CFR41.9/41.10/43.2/43.4/43.6/43.7		2.2.28			Given an evolution to be performed in Containment during fuel handling operations, evaluate the allowances of the evolution.	3.5		SRO			
RADIATION CONTROL – ALARA CFR41.12/43.4			2.3.2		Given an equipment clearance in a radiologically controlled area, describe the requirements of Independent Verification of Red Tags.	2.9	127	SRO	2.2.13: 3.8	BANK NRC 3/98	
RADIATION CONTROL – Radioactive Material Transfer Requirements CFR41.10/43.4			2.3.3		Describe the Shift Manager responsibility for shipments of Radioactive material offsite.	2.9	200	SRO	2.4.30: 3.6	BANK NRC 5/00	HAZMAT PLAN
PAGE 1 TOTAL TIER 3	5	4	2	0	PAGE TOTAL # QUESTIONS	11					

CATEGORY	C1	C2	C3	C4	TOPIC(S)	IMP	REC #	SRO/RO /BOTH	RELATED K/A	ORIGIN	NOTES:
EMERGENCY PROCEDURES / PLAN – EOP Bases CFR41.9/41.10/43.4/43.5				2.4.18	Describe the bases for venting the Containment irrespective of Offsite Release rates with Containment pressure approaching 22.4 psig.	3.6		SRO			EOP Bases
EMERGENCY PROCEDURES / PLAN – SAPs CFR41.10/43.5				2.4.37	Given plant conditions determine the responsibilities and actions to be taken when transitioning between EOPs and SAPs.	3.5		SRO	2.4.16: 4.0		EOP/SAP
EMERGENCY PROCEDURES / PLAN – EAL CFR41.10/43.5				2.4.41	Given plant conditions, determine the Emergency Action Level Classification.	4.1		SRO			EPP Implementation
EMERGENCY PROCEDURES / PLAN – EOPs CFR41.10/43.5				2.4.20	Given conditions delineated in Caution 1 of the EOPs, determine when EOP transition to contingencies is required.	4.0		SRO	2.4.18: 3.6 2.4.22: 4.0 2.4.23: 3.8		EOP usage
EMERGENCY PROCEDURES / PLAN – Security Threat CFR41.10/43.5				2.4.4	Given a security threat to the Control Room, determine actions to be taken.	4.3		SRO	2.4.49: 4.0 2.1.2: 4.0 2.1.6: 4.3		Security Threat AOP
EMERGENCY PROCEDURES / PLAN – Shift Manning / Fire Brigade CFR41.10/43.1/43.2/43.5				2.4.26	Given a situation with a fire brigade member unavailable, determine shift manning requirements and actions.	3.3		SRO	2.1.4: 3.4 2.1.5: 3.4		Minimal staffing
PAGE 2 TOTAL TIER 3	0	0	0	6	PAGE TOTAL # QUESTIONS	6					
PAGE 1 TOTAL TIER 3	5	4	2	0	PAGE TOTAL # QUESTIONS	11					
K/A CATEGORY TOTALS:	5	4	2	6	TIER 3 GROUP POINT TOTAL	17					

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JUSTIFICATIONS FOR DELETIONS ON WRITTEN EXAMINATION OUTLINE

SYSTEMS DELETED

201002 Reactor Manual Control System - This system is not incorporated into the BWR-6 design. The functions of this system are incorporated into the Rod Control and Information System.

201004 Rod Sequence Control System - This system is not incorporated into the BWR-6 design. The functions of this system are incorporated into the Rod Control and Information System.

201006 Rod Worth Minimizer System - This system is not incorporated into the BWR-6 design. The functions of this system are incorporated into the Rod Control and Information System.

214000 Rod Position Information System - This system is not incorporated into the BWR-6 design. The functions of this system are incorporated into the Rod Control and Information System.

215002 Rod Block Monitor System - This system is not incorporated into the BWR-6 design. The functions of this system are incorporated into the Rod Control and Information System.

206000 High Pressure Core Injection (HPCI) - This system is not incorporated into the BWR 6 design.

207000 Isolation (Emergency) Condenser - This system is not incorporated into the BWR 6 design. This was replaced by the Mark III Containment Suppression Pool.

219000 RHR/LPCI: Torus Cooling Mode - The BWR 6 Mark III Containment utilizes a Suppression Pool instead of a Torus.

230000 RHR/LPCI: Torus/Pool Spray Mode - This system is not incorporated into the BWR 6 Mark III Containment design.

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WRITTEN EXAMINATION

Knowledge and Abilities which were hit on the random selection which had Importance values < 2.5 were replaced with alternate random selections.

Knowledge and Abilities that were hit on the random selection which in NUREG 1123 listed NONE were replaced with alternate topics for the System or Evolution.

For Tiers 1 and 2, Generic topics were selected from K/As that had more hits and had topics that would be served well in the Generics.

Plant Generics Knowledge and Abilities

Based on 127 topic areas that apply to a single unit BWR.

			RO	SRO
Conduct of Operations	34 topics =	27%	4	5
Equipment Control	32 topics =	25%	3(2)	4
Radiation Control	11 topics =	9%	1(2)	2
Emergency Procedures/Plan	50 topics =	39%	5	6
TOTAL	127	100%	13	17

BOTH WRITTEN

295025 ① Moved from random selection A2 to Generics.

295031 ② Moved from random selection A2 to Generics.

500000 ③ Moved from random selection A2 to Generics

295012 ④ Moved from random selection K1 to K2, due to change in Abnormal Operating Procedure adding caution.

295021 ⑤ Moved from random selection K2 to Generics.

202002 ⑥ Moved from random selection K2 to K3, due to low importance values of K2 topics.

204000 ⑦ Moved from random selection A4 to Generics, identifies precaution associated with the system during startup operations.

263000 ⑧ Moved random selection from A1 to K2, A1 had one topic of battery discharge rates which has little discriminatory value.

WRITTEN EXAMINATION
BOTH (continued)

271000 ⑨ HWC system installed with Oxygen injection to Offgas. This is an increased hazard to the plant with a sudden loss of oxygen injection.

268000 ⑩ Random selection was K5 that has low discriminatory value, moved to category A2 that only had two topics.

288000 ⑩ Random selection was A4 that had multiple topics in Tier 2. Category K5 needed an additional, topic 288000 was moved to category K5.

201003 © Original selection K2, K2 for CRD Mechanism is NONE, moved to A2.

SENIOR REACTOR OPERATOR WRITTEN

NONE

~~**REACTOR OPERATOR WRITTEN**~~ 12/14/00

~~245000 ® Moved from random selection A2 to Generic, Standing order concerning sustained loss of AC power to Hydrogen Seal Oil with DC Seal Oil Pump undersized requiring degassing of Generator to prevent Hydrogen egress from the Generator.~~