

PVNGS NRC License Examination
July 2001 PWR RO Written examination outline

PVNGS Form ES-401-4

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	1	3	2				5	4			1	16	
	2	1	1	3				3	7			2	17	
	3	1		1				1					3	
	Tier Totals	3	4	6				9	11			3	36	
2. Plant Systems	1	2	2	2		3	3	1	1	3	2	4	23	
	2	3	4		2	2		2	2	2	1	2	20	
	3	1	2			1					2	2	8	
	Tier Totals	6	8	2	2	6	3	3	3	5	5	8	51	
3. Generic Knowledge and Abilities					Cat 1	Cat 2	Cat 3	Cat 4						13
					3	3	2	5						
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 one given system unless they are related 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.												

PVNGS NRC License Examination
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 Emergency and Abnormal Plant evolutions – Tier 1 Group 1

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E/APE #/Name/Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topics	Imp.	Points
000005 /Inoperable/Stuck Control Rod /I				X			AA1.03	Operate and / or monitor an Inoperable / Stuck Control Rod	3.4	1
000015/17 /RCP Malfunctions /IV										
A13 /Natural Circulation /IV					X		AA2.2	Adherence to procedures and operational limits	2.9	1
000024 /Emergency Boration /I			X				AK3.01	Identifying when emergency boration is required	4.1	1
000026 /Loss of Comp. Cooling Water /VIII				X			AA1.01	Flow rates to components / Interactions Among	3.1	1
000027 /Pzr Press. Ctrl. Malf. /III				X			AA1.02	PZR heaters controlled in manual	3.1	1
000040/E05 Excess Steam Demand /IV	X						AK1.05	Steam Line Rupture: Reactivity effects of cooldown	4.1	1
A11 /RCS Overcooling/PTS /IV		X					AK2.1	Component / System Function / Failure Mode	3.2	1
000051 /Loss of Condenser Vacuum /IV			X				AK3.01	(PLANT EVENT) Loss of steam dump capability upon loss of condenser vacuum	2.8	1
000055 /Station Blackout /VI						X	2.1.2	Knowledge of operator responsibilities during all modes	3.0	1
000057 /Loss of Vital AC Inst. Bus /VI					X		AA2.03	RPS panel alarm annunciators and trip indicators	3.7	1
000062 /Loss of Nuclear Service Water /IV					X		AA2.04	The normal values and upper limits for the temperatures of the components cooled by CCW	2.5	1
000067 /Plant Fire on Site /IX				X			AA1.09	(PLANT EVENT) Plant fire zone panel (including detector location)	3.0	1
000068 /Control Room Evacuation /VIII		X					AK2.07	ED/G operation following CR Evacuation	3.3	1
000069 /Loss of Containment Integrity /V		X					AK2.03	Personnel access hatch and emergency access hatch	2.8	1
000074 /Inadequate Core Cooling /IV				X			EA1.24	Turbine bypass valve hand/auto controls, indicators, and setpoints	3.6	1
000076 /High RCS Activity /IX					X		AA2.02	Corrective actions high fission product activity in RCS	2.8	1
K/A Category Totals	1	3	2	5	4	1		Group Point Total		16

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 Emergency and Abnormal Plant evolutions – Tier 1 Group 2

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E/APE #/Name/Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topics	Imp.	Points
000001 /Continuous Rod Withdrawal /I		X					AK2.01	Rod bank step counters	2.9	1
000003 /Dropped Control Rod /I					X		AA2.01	Rod position indication to actual position	3.7	1
000007/E02 /Reactor Trip-Recovery /I					X		EA2.2	(PLANT EVENT) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.0	1
000008 /Pzr Vapor Space Accident /III					X		AA2.10	High-pressure injection valves and controllers	3.6	1
000009 /Small Break LOCA /III				X			EA1.13	ESFAS, HPSI Throttle criteria	4.4	1
000011 /Large Break LOCA /III			X				EK3.01	Verify Main Steam Isolation Valve position	3.4	1
000022 /Loss of Rx Coolant Makeup /II				X			AA1.07	Letdown containment isolation valves indication and switches	2.8	1
000025 /Loss of RHR System /IV			X				AK3.01	Shifting to an alternate flowpath	3.1	1
000029 /ATWS /I					X		EA2.01	NI response/indication to an ATWS	4.4	1
000032 /Loss of Source Range NI/VII					X		AA2.06	Confirmation of reactor trip	3.9	1
000033 /Loss of Intermediate Range NI /VII			X				AK3.02	Guidance contained in EOP for loss of intermediate- range instrumentation	3.6	1
000037 /SG Tube Leak /III										
000038 /SG Tube Rupture /III					X		EA2.10	Plant conditions, from survey of control room indications (10CFR55.43)	3.1	1
000054/E06 /Loss of Feedwater /IV						X	2.4.34	Operations outside Control Room	3.8	1
000058 /Loss of DC Power /VI										
000059 /Acc. Liquid Radwaste Release /IX						X	AK1.05	Calculation of Offsite Dose	2.6	1
000060 /Acc. Gaseous Radwaste Release /IX					X		EA2.04	The effects on the power plant of isolating a given radioactive-gas leak	2.6	1
000061 /ARM System Alarms /VII						X	2.1.7	Interpolate plant performance based upon multiple inputs	3.7	1
E09 /Functional Recovery				X			EA1.3	Desired operating results during abnormal and emergency situations	3.6	1
K/A Category Totals		1	3	3	7	3		Group Point Total		17

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 Emergency and Abnormal Plant evolutions – Tier 1 Group 3

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E/APE #/Name/Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topics	Imp.	Points
000028 /Pzr Level Malfunction /II										
000036 /Fuel Handling Accident /VIII				X			AA1.04	Fuel handling equipment during an incident	3.1	1
000056 /Loss of Off-Site Power /VI	X						AK1.01	Principle of cooling by natural convection	3.7	1
000065 /Loss of Instrument Air /VIII			X				AK3.08	Actions for loss of instrument air	3.7	1
A16 /Excessive RCS Leakage /II										
K/A Category Totals	1		1	1				Group Point Total		3

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Plant Systems – Tier 2 Group 1

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System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Points
001 Control Rod Drive				X								K4.13	Transferring rods and rod groups	3.4	1
001 Control Rod Drive					X							K5.84	Significance of sign change (plus or minus) in reactivity due to change in boron concentration	3.3	1
003 Reactor Coolant Pump		X										K2.01	Power supply to RCPs	3.1	1
003 Reactor Coolant Pump	X											K1.10	Cause-effect relationships between the RCPs and the RCS	3.0	1
004 Chemical and Volume Control										X		A4.15	(PLANT EVENT) Temp effect on Boron concentration	3.6	1
004 Chemical and Volume Control											X	2.2.27	Refueling Process	2.6	1
013 ESF Actuation										X		A4.02	Reset of ESFAS channels	4.3	1
013 ESF Actuation	X											K1.03	ESFAS effect on Containment Cooling System	3.8	1
015 Nuclear Instrumentation					X							K5.02	Operation of detector	2.7	1
015 Nuclear Instrumentation				X								K4.06	Reactor trip bypasses	3.9	1
017 In-Core Temperature Monitor						X						K6.01	Loss of sensor or detector	2.7	1
017 In-Core Temperature Monitor				X								K4.02	Core hot spot determination	3.1	1
022 Containment Cooling							X					A1.03	Containment humidity design limits	3.1	1
022 Containment Cooling								X				A2.04	Loss of service water effect	2.9	1
056 Condensate								X				A2.04	Procedure usage for loss of condensate pumps	2.6	1
056 Condensate	X											K1.03	Cause effect relationship to MFW	2.6	1
059 Main Feedwater									X			A3.02	Automatic operation of programmed levels	2.9	1
059 Main Feedwater									X			A3.03	Feed pump suction low press	2.9	1
061 Auxiliary Feedwater		X										K2.02	Power supply to AFW Pump	3.7	1
068 Liquid Radwaste										X		A4.01	Manually operate control board for boron recovery	2.7	1
071 Waste Gas Disposal								X				A2.09	Actions for Stuck-open relief valve	3.0	1
072 Area Radiation Monitoring										X		A4.02	Reset of ESFAS channels	2.5	1
072 Area Radiation Monitoring								X				A2.01	Mitigate consequences of failed power supply	2.7	1
K/A Category Point totals	3	2		3	2	1	1	4	2	4	1		Group Point Total		23

PVNGS NRC License Examination
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Plant Systems – Tier 2 Group 2

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System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Points
002 Reactor Coolant						X						K6.03	Loss of Reactor vessel level indication	3.1	1
006 Emergency Core Cooling											X	2.4.2	EOP entry condition	3.9	1
010 Pressurizer Pressure Control			X									K3.02	Loss of PCS effect on RPS	4.0	1
011 Pressurizer Level Control											X	2.2.1	Level Effects on reactivity	3.7	1
012 Reactor Protection						X						K6.08	Loss of COLSS effect on RPS	3.6	1
014 Rod Position Indication							X					A1.03	PDIL Limits	3.6	1
016 Non-Nuclear Instrumentation								X				A3.02	Relationship between meter readings and actual parameter value	2.9	1
026 Containment Spray											X	2.3.2	ALARA Program	2.5	1
029 Containment Purge	X											K1.02	Containment radiation monitor effect on system	3.3	1
033 Spent Fuel Cooling				X								K4.01	Basis for maintaining 23' water level above fuel	2.9	1
035 Steam Generator			X									K3.02	Loss of SG effect on ECCS	4.0	1
039 Main and Reheat Steam							X					A1.05	System effect on Tave	3.2	1
055 Condenser Air Removal	X											K1.06	Cause effect relationship to PRMs	2.6	1
062 AC Electrical Distribution				X								K4.10	Uninterruptable AC power sources	3.1	1
063 DC Electrical Distribution										X		A4.03	Monitor battery discharge rate in the CR	3.0	1
064 Emergency Diesel Generator								X				A2.15	Water buildup in cylinders and their effect of EDG	2.6	1
073 Process Radiation Monitoring	X											K1.01	PRM relationship with other systems	3.6	1
075 Circulating Water								X				A2.03	Loss of CW effects on other systems	2.5	1
079 Station Air	X											K1.01	SAS and IAS relationship	3.0	1
086 Fire Protection										X		A4.06	Halon system operation from CR	3.2	1
K/A Category Point totals	4		2	2		2	2	3		2	3		Group Point Total		20

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Plant Systems – Tier 2 Group 3

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System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Points
005 Residual Heat Removal											X	2.1.14	System Status Control requiring notification	2.5	1
007 Pressurizer Relief/Quench Tank									X			A3.01	Monitor auto operation of items discharging to PRT	2.7	1
008 Component Cooling Water															
027 Containment Iodine Removal	X											K1.01	Cause effect relationship to CSS	3.4	1
028 H2 Recombiner and Purge Control															
034 Fuel Handling Equipment				X								K4.03	Overload protection	2.6	1
041 Steam Dump/Turbine Bypass Control									X			A3.02	(PLANT EVENT) SBCS response to increasing Rx Power	3.3	1
045 Main Turbine Generator										X		A4.01	(PLANT EVENT) Turbine Response to Generator Trip	3.1	1
076 Service Water										X		A4.01	Spray Pond pump response to auto ESF signal	2.9	1
078 Instrument Air	X											K1.01	Cause effect relationship to loss of sensor air	2.8	1
103 Containment															
K/A Category Point totals	2			1					2	2	1		Group Point Total		8

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Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.18	Ability to make accurate, clear and concise logs, records, status boards, and reports.	2.9	1
	2.1.24	Ability to obtain and interpret station electrical and mechanical drawings.	2.8	1
	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	3.4	1
	Total			3
Equipment Control	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4.0	1
	2.2.12	Knowledge of surveillance procedures.	3.0	1
	2.2.23	Ability to track limiting conditions for operations.	2.6	1
	Total			3
Radiation Control	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	2.6	1
	2.3.2	Knowledge of facility ALARA Program	2.5	1
	Total			2
Emergency Procedures and Plan	2.4.12	Knowledge of general operating crew responsibilities during emergency operations.	3.4	1
	2.4.19	Knowledge of EOP layout, symbols, and icons.	2.7	1
	2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes.	3.3	1
	2.4.21	Knowledge of Logic for Safety Functions	3.7	1
	2.4.27	Knowledge of fire in the plant procedure.	3.0	1
	Total			5
Target Point Total RO				13

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	2	4	4				4	9			1	24
	2			3				3	8			2	16
	3	1						2					3
	Tier Totals	3	4	7				9	17			3	43
2. Plant Systems	1	2	1		1	2	1	2	3		3	4	19
	2	3	1	2	1		1	1	2	1	1	4	17
	3									1	2	1	4
	Tier Totals	5	2	2	2	2	2	3	5	2	6	9	40
3. Generic Knowledge and Abilities					Cat 1 3		Cat 2 6		Cat 3 2		Cat 4 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 one given system unless they are related 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 SRO 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.											

PVNGS NRC License Examination
July 2001 PWR SRO Written examination outline
Emergency and Abnormal Plant evolutions – Tier 1 Group 1

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E/APE #/Name/Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topics	Imp.	Points
000001 Continuous Rod Withdrawal /1		X					AK2.01	Continuous Rod Withdrawal Indications	3.2	1
000003 Dropped Control Rod /1					X		AA2.01	Rod position indication to actual rod position	3.9	1
000005 Inoperable/Stuck Control Rod /1				X			AA1.03	Operate and / or monitor an Inoperable / Stuck Control Rod	3.4	1
000011 Large Break LOCA /3					X		EA2.01	Actions based on RCS temp. and press. - saturated and superheated (10CFR55.43)	3.5	1
000011 Large Break LOCA /3			X				EK3.01	Verifying main steam isolation valve position	3.5	1
000015/17 RCP Malfunctions /4					X		AA2.09	(PLANT EVENT) When to secure RCP's on high stator temp. (10CFR55.43)	2.7	1
A13 Natural Circulation /4					X		AA2.02	Facility Heat Removal OPS	3.8	1
000024 Emergency Boration /1			X				AK3.01	Identifying when emergency boration is required	4.4	1
000026 Loss of Comp. Cooling Water /8				X			AA1.01	Flow rates to components / Interactions Among	3.1	1
000029 ATWS /1					X		EA2.01	Reactor nuclear instrumentation indications for ATWS	4.7	1
000040/E05 Steam Line Rupture /4	X						AK1.05	Steam Line Rupture: Reactivity effects of cooldown	4.4	1
A11 RCS Overcooling/PTS /4		X					AK2.01	Component / System Function / Failure Mode	3.4	1
000051 Loss of Condenser vacuum /4			X				AK3.01	(PLANT EVENT) Loss of steam dump capability upon loss of condenser vacuum	3.7	1
000055 Station Blackout /6						X	2.1.2	Knowledge of operator responsibilities during all modes	4.0	1
000057 Loss of Vital AC Instrument Bus /6					X		AA2.03	RPS panel alarm annunciators and trip indicators	3.9	1
000059 Accidental Liquid RadWaste Rel. /9	X						AK1.05	Calculate offsite doses due to a release from the power plant	3.6	1
000062 Loss of Nuclear Service Water /4					X		AA2.04	The normal values and upper limits for the temperatures of the components cooled by CCW	2.9	1
000067 Plant Fire on Site /9				X			AA1.09	(PLANT EVENT) Plant fire zone panel (including detector location)	3.3	1
000068 Control Room Evac. /8					X		AA2.11	Indications of natural circulation (10CFR55.43)	4.4	1
000068 Control Room Evac. /8		X					AK2.07	ED/G operation following CR Evacuation	3.4	1
000069 Loss of CTMT Integrity /5		X					AK2.03	Personnel access hatch and emergency access hatch	2.9	1
000074 Inadequate Core Cooling /4				X			EA1.24	Turbine bypass valve hand/auto controls, indicators, and setpoints	3.8	1
000076 High Reactor Coolant Activity /9					X		AA2.02	Corrective actions high fission product activity in RCS (10CFR55.43)	3.0	1
000076 High Reactor Coolant Activity /9			X				AK3.05	Corrective actions high fission-product radioactivity level in the RCS	3.6	1
K/A Category Totals	2	4	4	4	9	1		Group Point Total		24

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 Emergency and Abnormal Plant evolutions – Tier 1 Group 2

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E/APE #/Name/Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topics	Imp.	Points
000007/E02 Reactor Trip – Recovery /1					X		EA2.02	(PLANT EVENT) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	4.0	1
000008 Pzr Vapor Space Accident /3					X		AA2.10	High-pressure injection valves and controllers	3.6	1
000009 Small Break LOCA /3				X			EA1.13	ESFAS, HPSI Throttle criteria	4.4	1
000022 Loss of Rx Coolant Makeup /2					X		AA2.04	How long PZR level can be maintained within limits (10CFR55.43)	3.8	1
000025 Loss of RHR System /4					X		AA2.02	Leakage of reactor coolant from RHR into closed cooling water system or into reactor building atmosphere (10CFR55.43)	3.8	1
000027 Pzr Press. Ctrl. Sys. Malf. /3				X			AA1.02	PZR heaters controlled in manual	3.0	1
000032 Loss of Source Range NI /7					X		AA2.06	Confirmation of reactor trip	4.1	1
000033 Loss of Intermediate Range NI /7			X				AK3.02	Guidance contained in EOP for loss of intermediate- range instrumentation	3.9	1
000037 SG Tube Leak /3			X				AK3.05	Actions contained in procedures	4.0	1
000038 SG Tube Rupture/3					X		EA2.07	Plant conditions, from survey of control room indications (10CFR55.43)	4.8	1
000054 E06 Loss of Feedwater /4						X	2.4.34	Operations outside Control Room	3.6	1
000058 Loss of DC Power /6			X				AK3.02	Actions contained in EOP for loss of dc power	4.2	1
000060 Accidental Gaseous Radwaste Rel./9					X		EA2.04	The effects on the power plant of isolating a given radioactive-gas leak	3.4	1
000061 ARM System Alarms /7						X	2.1.7	Interpolate plant performance based upon multiple inputs	4.4	1
000065 Loss of Instrument Air /8					X		AA2.08	Failure modes of air-operated equipment (10CFR55.43)	3.3	1
E09 /Functional Recovery				X			EA1.03	Desired operating results during abnormal and emergency situations	3.8	1
K/A Category Totals			3	3	8	2		Group Point Total		16

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 Emergency and Abnormal Plant evolutions – Tier 1 Group 3

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E/APE #/Name/Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topics	Imp.	Points
000028 /Pzr Level Malfunction /2				X			AA1.05	Initiation of excess letdown per the CVCS due to PLCS malfunction	2.9	1
000036 /Fuel Handling Accident /8				X			AA1.04	Fuel handling equipment during an incident	3.7	1
000056 /Loss of Off Site Power /6	X						AK1.01	Principle of cooling by natural convection	4.2	1
A16 /Excessive RCS Leakage /2										
K/A Category Totals	1			2				Group Point Total		3

PVNGS NRC License Examination
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Plant Systems – Tier 2 Group 1

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System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Points
001 Control Rod Drive					X							K5.84	Significance of sign change (plus or minus) in reactivity due to change in boron concentration	3.5	1
003 Reactor Coolant Pump	X											K1.10	Cause-effect relationships between the RCPs and the RCS	3.2	1
004 Chemical and Volume Control										X		A4.15	(PLANT EVENT) Temp effect on Boron concentration	3.7	1
013 ESFAS										X		A4.02	Reset of ESFAS channels	4.4	1
013 ESFAS	X											K1.03	ESFAS effect on Containment Cooling System	4.1	1
014 Rod Position Indication							X					A1.03	PDIL Insertion Limits	3.8	1
015 Nuclear Instrumentation				X								K4.06	Reactor trip bypasses	4.2	1
017 In-Core Temperature Monitor						X						K6.01	Loss of sensor or detector	3.0	1
022 Containment Cooling							X					A1.03	Containment humidity design limits	3.4	1
022 Containment Cooling								X				A2.04	Loss of service water effect	3.2	1
026 Containment Spray											X	2.1.20	CS procedure usage in EOP (10CFR55.43)	4.2	1
056 Condensate								X				A2.04	Procedure usage for loss of condensate pumps	2.8	1
059 Main Feedwater											X	2.2.3	Procedural/Operational Unit differences (10CFR55.43)	3.3	1
061 Auxiliary Feedwater		X										K2.02	Power supply to AFW Pump	3.7	1
061 Auxiliary Feedwater					X							K5.02	Decay heat sources and magnitude	3.6	1
063 DC Electrical Distribution											X	2.1.12	Interpret Tech Spec LCO (10FR55.43)	4.0	1
068 Liquid Radwaste											X	2.1.32	Limits and Precautions (10CFR55.43)	3.8	1
071 Waste Gas Disposal								X				A2.09	Actions for Stuck-open relief valve	3.5	1
072 Area Radiation Monitoring										X		A4.02	Reset of ESFAS channels	2.5	1
K/A Category Point totals	2	1		1	2	1	2	3		3	4		Group Point Total		19

PVNGS NRC License Examination
July 2001 PWR SRO Written examination outline
Plant Systems – Tier 2 Group 2

PVNGS Form ES-401-3

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Points
002 Reactor Coolant						X						K6.03	Loss of Reactor vessel level indication	3.6	1
006 Emergency Core Cooling											X	2.4.2	EOP entry condition	4.1	1
010 Pressurizer Pressure Control		X										K2.01	PZR power supply	3.4	1
011 Pressurizer Level Control											X	2.2.1	Level Effects on reactivity	3.6	1
012 Reactor Protection											X	2.4.39	RO's responsibility for Eplan implementation (10CFR55.43)	3.1	1
016 Non-Nuclear Instrumentation									X			A3.02	Relationship between meter readings and actual parameter value	2.9	1
027 Containment Iodine Removal															
028 H2 Recombiner and Purge Control															
029 Containment Purge	X											K1.02	Containment radiation monitor effect on system	3.6	1
033 Spent Fuel Pool Cooling				X								K4.01	Basis for maintaining 23' water level above fuel	3.2	1
034 Fuel Handling Equipment											X	2.2.27	Knowledge of Refueling Process (10CFR55.43)	3.5	1
035 Steam Generator			X									K3.02	Loss of SG effect on ECCS	4.3	1
039 Main and Reheat Steam							X					A1.05	System effect on Tave	3.3	1
055 Condenser Air Removal															
062 AC Electrical Distribution			X									K3.01	Major system load lost of loss of power	3.9	1
064 Emergency Diesel Generator								X				A2.15	Water buildup in cylinders and their effect of EDG	3.1	1
073 Process Radiation Monitoring	X											K1.01	PRM relationship with other systems	3.9	1
075 Circulating Water								X				A2.03	Loss of CW effects on other systems	2.7	1
079 Station Air	X											K1.01	SAS and IAS relationship	3.1	1
086 Fire Protection										X		A4.06	Halon system operation from CR	3.2	1
103 Containment															
K/A Category Point totals	3	1	2	1		1	1	2	1	1	4		Group Point Total		17

PVNGS NRC License Examination
 July 2001 PWR SRO Written examination outline
 Plant Systems – Tier 2 Group 3

PVNGS Form ES-401-3

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Points
005 Residual Heat Removal											X	2.1.14	System Status Control requiring notification (10CFR55.43)	3.3	1
007 Pressurizer Relief/Quench Tank															
008 Component Cooling Water															
041 Steam Dump/Turbine Bypass Control									X			A3.02	(PLANT EVENT) SBCS response to increasing Rx Power	3.4	1
045 Main Turbine Generator										X		A4.01	(PLANT EVENT) Turbine Response to Generator Trip	2.9	1
076 Service Water										X		A4.01	Spray Pond pump response to auto ESF signal	2.9	1
078 Instrument Air															
K/A Category Point totals									1	2	1		Group Point Total		4

PVNGS NRC License Examination
July 2001 PWR SRO Written examination outline
Generic Knowledge and Abilities Outline (Tier 3)

PVNGS Form ES-401-5

Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.4	Knowledge of Shift Staffing requirements (10CFR55.43)	3.4	1
	2.1.10	Knowledge of Conditions and Limitations in the facility license (10CFR55.43)	3.9	1
	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for Technical Specifications	4.0	1
	2.1.			
	2.1.			
	Total			3
Equipment Control	2.2.6	Knowledge of the process for making changes in procedures as described in the Safety Analysis Report (10CFR55.43)	3.3	1
	2.2.11	Knowledge of the process for controlling temporary changes (10CFR55.43)	3.4	1
	2.2.12	Knowledge of Surveillance Procedures	3.4	1
	2.2.23	Ability to track Limiting Conditions for Operations	3.8	1
	2.2.25	Knowledge of bases in Technical Specifications for Limiting Condition for Operations and Safety Limits (10CFR55.43)	3.7	1
	2.2.31	Knowledge of SRO fuel handling responsibilities (10CFR55.43)	3.8	1
	2.2.			
	2.2.			
	Total			6
Radiation Control	2.3.1	Knowledge of 10 CFR 20 and related facility radiation control requirements (10CFR55.43)	3.0	1
	2.3.2	Knowledge of facility ALARA program	2.9	1
	2.3.			
	2.3.			
	Total			2
Emergency Procedures and Plan	2.4.12	Knowledge of general operating crew responsibilities during emergency operations	3.9	1
	2.4.16	Knowledge of EOP implementation hierarchy and coordination with other support procedures (10CFR55.43)	4.0	1
	2.4.20	Knowledge of operational implications of EOP warning, cautions, and notes	4.0	1
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including: 1. Reactivity control 2. Core cooling and heat removal 3. Reactor coolant system integrity. 4. Containment conditions 5. Radioactivity release control	4.3	1
	2.4.22	Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations (10CFR55.43)	4.0	1
	2.4.27	Knowledge of fire in plant procedure (10CFR55.43)	3.5	1
	Total			6
Target Point Total SRO				17