

Facility: <u><i>Palo Verde</i></u> Examination Level: <b>RO</b>		Date of Examination: <b><u>11/10/2008</u></b> Operating Test Number: <b><u>PVNGS RO</u></b>
<b>Administrative Topic</b> (see Note)	Type Code*	<b>Describe activity to be performed:</b>
Conduct of Operations	R, D	Knowledge of procedures, guidelines, or limitations associated with reactivity management. (Calculate a dilution for a power ascension) <i>Scheduled as Admin JPM RA-1.</i>
Conduct of Operations	R, N	Ability to make accurate, clear and concise logs, records, status boards, and reports. (Determine faults in Reactor Coolant System heatup rate) <i>Scheduled as Admin JPM RA-2. (NEW)</i>
Equipment Control	R, N	Knowledge of surveillance procedures. (Perform Inoperable Power Sources ST) <i>Scheduled as Admin JPM RA-3. (NEW)</i>
Radiation Control	R, D	Ability to comply with radiation work permit requirements during normal or abnormal conditons. (Determine requirements for RCA entry from a REP) <i>Scheduled as Admin JPM RA-4.</i>
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.		
*Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank ( $\leq 3$ for ROs: $\leq 4$ for SROs & RO retakes) (N)ew or (M)odified from bank ( $\geq 1$ ) (P)revious 2 exams ( $\leq 1$ ; randomly selected)		

Facility: <b><i>Palo Verde</i></b> Examination Level: <b>SRO</b>		Date of Examination: <b>11/10/08</b> Operating Test Number: <b><u>PVNGS SRO</u></b>
<b>Administrative Topic</b> (see Note)	Type Code*	<b>Describe activity to be performed:</b>
Conduct of Operations	R, N	Knowledge of procedures, guidelines, or limitations associated with reactivity management. (Candidate will review a dilution calculation) <i>Schedule as Admin JPM SA-1. (NEW)</i>
Conduct of Operations	R, P	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc (Candidate will be required to determine that OT limits have been exceeded) <i>Schedule as Admin JPM SA-2.</i>
Equipment Control	R, D	Knowledge of surveillance procedures. (Review 40ST-1ZZ02) <i>Schedule as Admin JPM SA-3.</i>
Radiation Control	R, N	Ability to comply with radiation work permit requirements during normal or abnormal conditions. (Candidate will be required to evaluate radiological conditions and determine dose limits.) <i>Schedule as Admin JPM SA-4. (NEW)</i>
Emergency Plan	S (or R), N	Knowledge of the emergency action level thresholds and classifications. (Candidate will determine EAL status and classification.) <i>Schedule as Admin JPM SA-5. (NEW)</i>
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.		
*Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank ( $\leq 3$ for ROs: $\leq 4$ for SROs & RO retakes) (N)ew or (M)odified from bank ( $\geq 1$ ) (P)revious 2 exams ( $\leq 1$ ; randomly selected)		

Facility: <b><u>PVNGS</u></b>	Date of Examination: <b><u>11/10/2008</u></b>
Exam Level: <b><u>RO</u></b>	Operating Test No.: <b><u>RO</u></b>

Control Room Systems<sup>@</sup> (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)

JPM #	System/JPM Title	Type Code*	Safety Function
JS1	Parallel Offsite Power to PBB-S03 ( <i>NEW</i> )	S N 3.6-062-A4.07 3.1/3.1	6
JS2	Verify RAS actuation ( <i>NEW</i> )	S A N L E 4.4-A16-AA1.1 3.4/3.6	4 (primary)
JS3	Borate the RCS with HPSI pump	S A D L 4.2.024.AK3.02 4.2/4.4	1
JS4	Isolate SG with SGTR in mode 5	S A D L P 4.2 037 EK3.06 4.2/4.3	5
JS5	Prepare SBCS for ECC unloading	S D 3.4.045.A4.02 2.7/2.6	4 (secondary)
JS6	Respond to High Pressurizer Pressure (failed channel)	S D 4.2.027.A1.01 4.0/3.9	3
JS7	Bypass FBEVAS	S D 3.7.016.A4.01 3.9/2.8	7
JS8	Loss of NCW, trip	S D 3.4.003.A2.02 3.7/3.7	8

In-Plant Systems<sup>@</sup> (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)

JP1	Put CEAs on Hold bus	D R 3.1.001.A2.14 3.7/3.9	1
JP2	Start AFN Locally using Standard Appendix 41	D E A 3.4-061-A2.03 3.6/3.1	4 (secondary)
JP3	Secure Air Dryer from parallel operations ( <i>NEW</i> )	N E A 4.2-065-AA1.03 2.9/31	8

@ 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.

*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/ Shutdown	≥ 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: <b><u>PVNGS</u></b>	Date of Examination: <b><u>11/10/2008</u></b>
Exam Level: <b><u>SRO</u></b>	Operating Test No.: <b><u>SRO-I</u></b>

Control Room Systems <sup>@</sup> (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)			
JPM #	System/JPM Title	Type Code*	Safety Function
JS1	Parallel Offsite Power to PBB-S03 ( <i>NEW</i> )	S N 3.6-062-A4.07      3.1/3.1	6
JS2	Verify RAS actuation ( <i>NEW</i> )	S A N L E 4.4-A16-AA1.1      3.4/3.6	4 (primary)
JS3	Borate the RCS with HPSI pump	S A D L 4.2.024.AK3.02      4.2/4.4	1
JS4	Isolate SG with SGTR in mode 5	S A D L P 4.2 037 EK3.06      4.2/4.3	5
JS5	Prepare SBCS for ECC unloading	S D 3.4.045.A4.02      2.7/2.6	4 (secondary)
JS6	Respond to High Pressurizer Pressure (failed channel)	S D 4.2.027.A1.01      4.0/3.9	3
JS7	Bypass FBEVAS	S D 3.7.016.A4.01      3.9/2.8	7

In-Plant Systems <sup>@</sup> (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
JP1	Put CEAs on Hold bus	D R 3.1.001.A2.14      3.7/3.9	1
JP2	Start AFN Locally using Standard Appendix 41	D E A 3.4-061-A2.03      3.6/3.1	4 (secondary)
JP3	Secure Air Dryer from parallel operations ( <i>NEW</i> )	N E A 4.2-065-AA1.03      2.9/31	8

@ 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.

*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 / Shutdown	≥ 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: <b><u>PVNGS</u></b>	Date of Examination: <b><u>11/10/2008</u></b>
Exam Level: <b><u>SRO</u></b>	Operating Test No.: <b><u>SRO-U</u></b>

Control Room Systems <sup>@</sup> (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)			
JPM #	System/JPM Title	Type Code*	Safety Function
JS1	Parallel Offsite Power to PBB-S03( <i>NEW</i> )	S N 3.6-062-A4.07      3.1/3.1	6
JS2	Verify RAS actuation ( <i>NEW</i> )	S A N L E 4.4-A16-AA1.1      3.4/3.6	4 (primary)
JS4	Isolate SG with SGTR in mode 5	S A D L P 4.2 037 EK3.06      4.2/4.3	5

In-Plant Systems <sup>@</sup> (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
JP1	Put CEAs on Hold bus	D R 3.1.001.A2.14      3.7/3.9	1
JP2	Start AFN Locally using Standard Appendix 41	D E A 3.4-061-A2.03      3.6/3.1	4 (secondary)

@ 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.

*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 / Shutdown	≥ 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	

**ES-301 Transient and Event Checklist Form ES-301-5**

Facility: Palo Verde		Date of Exam: 11/10/08						Operating Test Number: 2008									
APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP				
															R	I	U
RO <input type="checkbox"/>	RX	3												1	1	1	0
SRO-I <input type="checkbox"/>	NOR														1	1	1
SRO-U <input type="checkbox"/>	I/C	1, 2, 4, 5			1, 2, 3, 4, 7									9	4	4	2
<input checked="" type="checkbox"/> U1	MAJ	4			5									2	2	2	1
U2	TS	1, 3			2, 4									4	0	2	2
U3																	
RO <input type="checkbox"/>	RX	3												1	1	1	0
SRO-I <input type="checkbox"/>	NOR														1	1	1
<input checked="" type="checkbox"/> SRO-U	I/C	1, 2, 4, 5			1, 3, 4, 6, 7			1, 2, 3, 4, 5, 6						15	4	4	2
I1 <input type="checkbox"/>	MAJ	4			5			5						3	2	2	1
I3 <input type="checkbox"/>	TS	1, 3						1, 4						4	0	2	2
I4																	
RO <input type="checkbox"/>	RX		3											1	1	1	0
SRO-I <input type="checkbox"/>	NOR													1	1	1	1
<input checked="" type="checkbox"/> SRO-U	I/C		2, 4, 5		1, 2, 3, 4, 7					1, 2, 3, 5				12	4	4	2
I2 <input type="checkbox"/>	MAJ		4		5					5				3	2	2	1
I5 <input type="checkbox"/>	TS				2, 4									2	0	2	2
I6																	
RO <input checked="" type="checkbox"/>	RX		3											1	1	1	0
SRO-I <input type="checkbox"/>	NOR														1	1	1
<input type="checkbox"/> SRO-U	I/C		2, 4, 5				2, 4, 7							6	4	4	2
R1 <input type="checkbox"/>	MAJ		4				5							2	2	2	1
R2 <input type="checkbox"/>	TS														0	2	2
R8																	

**Instructions:**

- Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRP *additionally* serves in the BOP position, one I/C Malfunction can be credited toward the two I/C malfunctions required for the ATC position.
- Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (\*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
- Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

**ES-301 Transient and Event Checklist Form ES-301-5**

Facility: Palo Verde		Date of Exam: 11/10/08									Operating Test Number: 2008						
A P P L I C A N T	E V E N T  T Y P E	Scenarios												T O T A L	M I N I M U M (*)		
		1			2			3			4						
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
												R	I	U			
RO <input checked="" type="checkbox"/>	RX			3													1
SRO-I <input checked="" type="checkbox"/>	NOR													1	1	1	1
SRO-U <input type="checkbox"/>	I/C			1, 5, 6			2, 4, 7		2, 4, 5, 6					10	4	4	2
R5 R6 R7	MAJ			4			5		5					3	2	2	1
	TS														0	2	2
RO <input checked="" type="checkbox"/>	RX			3										1	1	1	0
SRO-I <input checked="" type="checkbox"/>	NOR													1	1	1	1
SRO-U <input type="checkbox"/>	I/C			1, 5, 6		1, 3, 4, 6, 7				1, 2, 3, 5				12	4	4	2
R3	MAJ			4		5				5				3	2	2	1
	TS														0	2	2
RO <input checked="" type="checkbox"/>	RX												1	1	1	1	0
SRO-I <input checked="" type="checkbox"/>	NOR														1	1	1
SRO-U <input type="checkbox"/>	I/C								2, 4, 5, 6				5, 6, 7	7	4	4	2
R10	MAJ								5				4	2	2	2	1
	TS														0	2	2
RO <input checked="" type="checkbox"/>	RX			3									1	2	1	1	0
SRO-I <input checked="" type="checkbox"/>	NOR														1	1	1
SRO-U <input type="checkbox"/>	I/C			1, 5, 6		1, 3, 4, 6, 7						2, 3, 5, 7		12	4	4	2
R4	MAJ			4		5						4		3	2	2	1
	TS														0	2	2

**Instructions:**

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRP *additionally* serves in the BOP position, one I/C Malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (\*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.



# Event counts for Scenario 5 (spare)

## ES-301 Transient and Event Checklist Form ES-301-5

Facility: Palo Verde		Date of Exam: 11/10/08						Operating Test Number: 2008													
APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)						
		5																			
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION										
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP								
		R	I	U																	
RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX NOR I/C MAJ TS																				
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX NOR I/C MAJ TS																				
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX NOR I/C MAJ TS																				
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX NOR I/C MAJ TS																				

**Instructions:**

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRP *additionally* serves in the BOP position, one I/C Malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (\*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.



Facility: <u>PVNGS</u>		Scenario No.: <u>1</u>		Op-Test No: <u>2008</u>	
Examiners: _____		Operators: _____		_____	
_____		_____		_____	
_____		_____		_____	
Initial Conditions: IC #50, 100% power, MOC.					
Turnover: Unit 1 has been at 100% power for the past 150 days. The alarm window on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days. Train B is protected equipment. Normal Shiftly Surveillances are complete. Risk Management Action Level is Green.					
Event No.	Malf. No.	Event Type*	Event Description		
1	cmTRRX09RCCPDT125_1	I CO/SRO (TS)	After the crew performs the beginning of shift reactivity brief, SG 2 d/P Transmitter RCC-PDI-125C fails low. CO evaluates Alarm Response 41AL-1RK5A. SRO evaluates LCO 3.3.1. CO will bypass the parameter at the PPS cabinets.		
2	mfRC03A f:1	C RO/SRO	RCP 1A Thrust Bearing oil level is low. RO refers to the Alarm Response procedure <b>40AL-9RJ01</b> . SRO directs restoring oil level above the alarm setpoint per <b>40OP-9RC01</b> .		
3	mfRD02A	R CO/RO/SRO (TS)	CEA 14 drops completely into the core. Crew enters 40AO-9ZZ11. Crew begins a 20% downpower.  <b>Critical Task – Begin downpower within 15 minutes</b>		
4	cmCPRC02RCEP01A_1 Scenario file “atws”	M- ALL  C RO/SRO	RCP 1A motor becomes uncoupled from the pump. The Reactor does NOT automatically trip.  The Crew must open supply breakers to Load Centers 3 and 10 to Deenergize CEDMCS.  <b>Critical Task –When reactor trip setpoints are exceeded with no automatic trip, manually trip (including deenergizing CEDMCS bus) the reactor.</b>		
5	mfED02 mfED13A	C CO/RO/SRO	The Unit loses Offsite power. The CRS enters 40EP-9EO07. Instrument bus NNN-D11 is lost, requiring manual operation of ADVs by the CO. The RO will secure RCP Seal Bleedoff.  <b>Critical Task – Use spray and/or control Heat Removal to prevent lifting primary safeties.</b>		
6	mfFW21A (AFN trip) or mfFW21B (AFB trip) or mfFW22 (AFA trip)	C-CO	The running Auxiliary Feedwater Pump trips. The CO shifts feed source to an unaffected pump.		
End point					

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

## Supplemental Turnover

### **Plant conditions:**

Unit 1 has been at 100% power for the past 150 days. MOC 250 EFPD. Normal Chiller A is tagged out for scheduled maintenance. Estimated return to service is 3 days.

Fuel Pool Cleanup is not on the Spent Fuel Pool.

### **Equipment out of service:**

The alarm window on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days.

Risk Management Action Level is GREEN.

Train B is protected equipment.

### **Planned shift activities:**

Normal, shiftly surveillance's are complete.

No other activities are planned.

### **Note:**

The crew will walk down the control boards and assume the shift and then perform a reactivity brief prior to the commencement of the evaluation.

Facility: <u>PVNGS</u>		Scenario No.: <u>2</u>		Op-Test No: <u>2008</u>	
Examiners: _____		Operators: _____		_____	
_____		_____		_____	
_____		_____		_____	
Initial Conditions: IC #20, 100% power, MOC.					
Turnover: Unit 1 has been at 100% power for the past 150 days. The alarm window on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days. Train B is protected equipment. Normal Shiftly Surveillances are complete. Risk Management Action Level is Green.					
Event No.	Malf. No.	Event Type*	Event Description		
1	cmCNCV04CHNFIC244_2	C RO/SRO	After the crew performs the beginning of shift reactivity brief, Seal Injection Flow Controller CHN-FIC-244 (RCP 2B) starts controlling high out of the band. The SRO directs the RO to place the controller in manual to stabilize the system.		
2	cmTRRX12SGDLT1113D_1	I CO/SRO (TS)	SG 1 Channel D Wide Range Level transmitter fails low. CO evaluates Alarm Response <b>41AL-1RK5A</b> . SRO evaluates LCO 3.3.1 and 3.3.5. CO will bypass parameters 7, 18, and 19 at the D PPS cabinet.		
3	cmCPHV17HJNJ01A_2	C RO/SRO	The A Battery Room Normal Exhaust fan trips. RO refers to <b>41AL-1RK2A</b> . SRO directs RO to start the A Battery Room Essential Exhaust fan.		
4	mfTH06B f:.4	C CO/RO/SRO (TS)	SG 2 develops a 5 gpm leak. SRO enters <b>40AO-9ZZ02</b> , Excessive RCS Leakrate. Crew commences a downpower to take the Unit offline. SRO evaluates LCO 3.4.14 for SG leakage.		
5	mfTH06B f:50	M- ALL	The leaking tube completely fails on SG 2. The crew will recognize the increased leak rate and trip the reactor.		
6	mfSI01B cmCPSI01SIAP02A_5	C-RO	HPSI B trips, HPSI A fails to start. RO starts HPSI A to establish Safety Injection flow. <b>Critical Task – Ensure adequate Safety Injection flow to meet Inventory Control Safety Function.</b>		
7	mfMS03C	C CO/RO/SRO	SG 2 develops a steam leak in the MSSS. SRO enters the <b>Functional Recovery Procedure</b> . CO will be directed to feed SG 2 1360-1600 gpm. RO will secure two RCPs on low RCS pressure. <b>Critical Task – Feed a rupture and faulted SG 1360-1600 gpm prior to exiting the FRP.</b>		
End point					

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

## Supplemental Turnover

### **Plant conditions:**

Unit 1 has been at 100% power for the past 150 days. MOC 250 EFPD. Normal Chiller A is tagged out for scheduled maintenance. Estimated return to service is 3 days.

Fuel Pool Cleanup is not on the Spent Fuel Pool.

### **Equipment out of service:**

The alarm window on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days.

Risk Management Action Level is GREEN.

Train B is protected equipment.

### **Planned shift activities:**

Normal, shiftly surveillance's are complete.

No other activities are planned.

### **Note:**

The crew will walk down the control boards and assume the shift and then perform a reactivity brief prior to the commencement of the evaluation.

Facility: <u>PVNGS</u>	Scenario No.: <u>3</u>	Op-Test No: <u>2008</u>	
Examiners: _____ _____	Operators: _____ _____		
Initial Conditions: IC #20, 100% power, MOC.			
Turnover: Unit 1 has been at 100% power for the past 150 days. The alarm on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days. Train B is protected equipment. Normal Shiftly Surveillances are complete. Risk Management Action Level is Green.			
Event No.	Malf. No.	Event Type*	Event Description
1	cmTRRX06RCAPT101A_1 f:2500	I CO/SRO (TS)	After the beginning of shift Reactivity Brief, RCA-PT-101A (Channel A Pressurizer Pressure Narrow Range) fails high. The SRO evaluates LCO 3.3.1. CO evaluates Alarm Response <b>41AL-1RK5A</b> and bypasses parameters 3, 4, and 5 on PPS cabinet A.
2	cmBKED05NANS02G_5	C CO/RO/SRO	The main feeder breaker for Cooling Tower 2 trips. The SRO enters <b>40AO-9ZZ07</b> , Loss of Condenser Vacuum. The Crew will downpower to maintain vacuum.
3	cmCPTP01CENP01B_6 cmCPTP01CENP01A_5	C CO/SRO	Stator Cooling Pump B trips and the A pump fails to auto start. The SRO will direct starting A pump (Turbine trip occurs in 70 seconds).
4	mfTH01A k:4 f:0.01	C RO/SRO (TS)	A RCS leak develops (16 gpm). SRO will enter <b>40AO-9ZZ02</b> , Excessive RCS Leakrate. RO will perform CVCS manipulations to determine leak size. SRO will evaluate LCO 3.4.14.
5	mfTH01B k:5 r:5:00 f:100  Scenario file "NoSICI"	M- ALL  C CO/RO/SRO	The LOCA degrades and the Reactor trips.  SIAS fails to initiate automatically. RO will stop RCPs on loss of subcooling. Crew performs <b>40EP-9EO01</b> , Standard Post Trip Actions. <b>Critical Task -When the SIAS setpoint is exceeded, ensure adequate Safety Injection prior to completions of the SPTAs.</b>
6	cmCPRH02SIAP01_6 cmMVRH06SIBUV615_6 cmMVRH06SIBUV625_1 e:"SIAS CH C"	C RO/SRO	When SIAS is actuated, LPSI A pump will trip. On the LPSI B system, injection valve SIB-UV-625 will trip its control power fuse. SIB-UV-615 will mechanically bind. The SRO will enter <b>40EP-9EO09</b> , Functional Recovery Procedure, to line up Containment Spray Pump A to the LPSI header. <b>Critical Task -When CSAS setpoint is exceeded, ensure adequate Containment Cooling to meet Safety Function requirements prior to the completion of the CTPC success path.</b>
End point			

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

## Supplemental Turnover

### **Plant conditions:**

### **Plant conditions:**

Unit 1 has been at 100% power for the past 150 days. MOC 250 EFPD. Normal Chiller A is tagged out for scheduled maintenance. Estimated return to service is 3 days.

Fuel Pool Cleanup is not on the Spent Fuel Pool.

### **Equipment out of service:**

The alarm on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days.

Risk Management Action Level is GREEN.

Train B is protected equipment.

### **Planned shift activities:**

Normal, shiftly surveillance's are complete.

No other activities are planned.

### **Note:**

The crew will walk down the control boards and assume the shift and then perform a reactivity brief prior to the commencement of the evaluation.

Facility: <u>PVNGS</u>		Scenario No.: <u>4</u>		Op-Test No: <u>2008</u>	
Examiners: _____		Operators: _____		_____	
_____		_____		_____	
_____		_____		_____	
Initial Conditions: IC #14, 14% power, MOC.					
Turnover: Unit 1 is at 14% power after a startup. The unit was shutdown for a week while repairing the C Class Battery Inverter. Normal Shiftly Surveillances are complete. Risk Management Action Level is Green.					
Event No.	Malf. No.	Event Type*	Event Description		
1		N CO/RO/SRO	After briefing the power maneuver, the Crew increases power to 17-19%.		
2	cmTRCV19RCALT110X_1	I RO/SRO (TS)	Train A Pressurizer Level transmitter fails low. RO uses 40AL-9RK4A and selects the unaffected channel. SRO evaluates Tech Specs 3.3.10 and 3.3.11.		
3	mfED11C	C RO/SRO (TS)	PBB-S04 bus trips on ground fault. SRO enters <b>40AO-9ZZ12</b> , Degraded Electrical. SRO evaluates LCO 3.8.9 (among many others). RO starts the standby Charging Pump or performs actions for loss of Letdown.		
4	mfFW19A	M- ALL	Main Feedwater Pump A trips. The Crew realizes that no Feedwater is now available and trips the reactor. The Crew performs Standard Post Trip Actions.		
5	cmTRMS02SGNPT1024_4 mfRD03I mfRD03K	I-CO  C RO/SRO	On the trip, SGN-PT-1024 fails low. The CO must establish heat removal with ADVs or SBCS in Manual. CEAs 57 and 66 will stick out, requiring the RO to borate the RCS <b>Critical Task – Establish secondary heat removal prior to lifting primary safeties.</b> <b>Critical Task – With two or more CEAs stuck out, ensure adequate boration prior to the completion of the SPTAs.</b>		
6	cmMVMC04CTAHV1_6	C CO/SRO	AFN-P01 will have a suction valve stuck closed, requiring the CO to use AFA-P01.		
7	mfFW22	C CO/RO/SRO	AFA-P01 will trip after running two minutes. The SRO will enter <b>40EP-9EO06</b> , Loss of Feedwater. The RO stops RCPs per the LOAF procedure. The SRO will direct the CO to establish feed water using the B MFP.  <b>Critical Task – Establish Feedwater to at least one SG prior to drying out both SGs.</b>		
End point					

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

## Supplemental Turnover

### **Plant conditions:**

Unit 1 is at 14% power after a startup. The unit was shutdown for a week while repairing the C Class Battery Inverter. Normal Shiftly Surveillances are complete. Risk Management Action Level is Green.

Main Turbine is on line carrying 90 MW.

Circ water pumps A and C are running.

Condensate Demineralizers A, B, and C are in service. D, E, and F are in Standby.

MFP A is in service.

Heater Drain Pumps are secured.

CEDMCS is in Manual Sequential

Pressurizer is in boron equalization.

Fuel Pool Cleanup is not on the Spent Fuel Pool.

### **Equipment out of service:**

All equipment is available for operation.

Risk Management Action Level is GREEN.

Train B is protected equipment.

### **Planned shift activities:**

Normal, shiftly surveillance's are complete.

Currently, you are in 40OP-9ZZ04, Step 4.3.70.

The crew is to raise power to 17-19% power and hold at Step 4.3.72 until the Mode Change Checklist for exceeding 20% power is complete.

### **Note:**

The crew will walk down the control boards and assume the shift and then perform a reactivity brief prior to the commencement of the evaluation.

Facility: <u>PVNGS</u>	Scenario No.: <u>5</u>	Op-Test No: <u>2008</u>	
Examiners: _____ _____	Operators: _____ _____		
Initial Conditions: IC #50, 100% power, MOC.			
Turnover: Unit 1 has been at 100% power for the past 150 days. RCS sampling is in progress. Train B is protected equipment. Normal Shiftly Surveillances are complete. Risk Management Action Level is Green.			
Event No.	Malf. No.	Event Type*	Event Description
1	diRC_ZDSSAHS204A f:open	C CO/SRO (TS)	After the crew performs the beginning of shift reactivity brief, Chemistry calls to say that the sample lineup can be secured. SSA-UV-204 will not close when operated. SRO enters LCO 3.6.3.
2	mFRP06H1	C CO/RO/SRO (TS)	B Train CSAS occurs. SRO enters 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuators. RO will override and stop equipment. CO overrides NCW valves to restore flow to RCPs. LCO 3.6.6 entered when equipment is overridden.
3	cmCPFW10EDNP01A_6	C RO/CO/SRO	Heater Drain Pump A trips. SRO/CO lower turbine load to raise Main Feedpump suction pressure to greater than 300#
4	mfTC13	M-ALL	Turbine Trip/ Load Reject/ Reactor Power Cutback. SRO enters 40A0-9ZZ08 (Load Reject).
5	mFRD11B	C RO/SRO	CEAs continue to insert requiring a manual Reactor trip.  <b>Critical Task –When control of CEAs is lost, manually trip the reactor prior to exiting the CEA Malfunction AOP.</b>
6	cmTRMS02SGNPT1027_4	I CO	Steam Bypass Control System instrument failure, CO takes action to restore heat removal. (SGN-PT-1027 fails low)
7	cmHXCv16RCEE05D_2 e:RPSCHC r:300 f:100.0	C CO/RO/SRO	Inter-system LOCA on the 2B RCP. Crew takes actions to isolate the 2B RCP.  <b>Critical Task -When an intersystem LOCA exists, ensure adequate Containment Isolation to meet Safety Function requirements prior to exiting the LOCA procedure.</b>
End point			RCP 2B Hi pressure cooler isolation valves are closed

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

## Supplemental Turnover

### **Plant conditions:**

Unit 1 is MOC 250 EFPD. Reactor power has been at 100% power for the past 150 days. RCS sampling is in progress.

Fuel Pool Cleanup is not on the Spent Fuel Pool.

### **Equipment out of service:**

Risk Management Action Level is GREEN.

Train B is protected equipment.

### **Planned shift activities:**

Normal, shiftly surveillance's are complete.

No other activities are planned.

### **Note:**

The crew will walk down the control boards and assume the shift and then perform a reactivity brief prior to the commencement of the evaluation.

Facility: PVNGS

Printed: 08/22/2008

Date Of Exam: 11/07/2008

Tier	Group	RO K/A Category Points											SRO-Only Points					
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2	G*	Total		
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A		3	18	0	0	0		
	2	2	2	2				1	1			1	9	0	0	0		
	Tier Totals	5	5	5				4	4			4	27	0	0	0		
2. Plant Systems	1	3	2	3	3	2	2	3	3	2	3	2	28	0	0	0		
	2	1	1	1	1	1	1	1	1	1	0	1	10	0	0	0		
	Tier Totals	4	3	4	4	3	3	4	4	3	3	3	38	0	0	0		
3. Generic Knowledge And Abilities Categories				1		2		3		4		10		1	2	3	4	0
				3		2		2		3				0	0	0	0	

Note:

1. 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).
2. 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.
3. 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/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. 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.
5. 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.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
- 7.\* 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. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. 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; if fuel handling equipment is sampled in other than Category A2 or G\* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. 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.

PWR RO Examination Outline

Printed: 08/22/2008

Facility: PVNGS

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000008 Pressurizer Vapor Space Accident / 3		X					AK2.03 - Controllers and positioners	2.5	1
000009 Small Break LOCA / 3		X					EK2.03 - S/Gs	3.0	1
000011 Large Break LOCA / 3	X						EK1.01 - Natural circulation and cooling, including reflux boiling	4.1	1
000015/000017 RCP Malfunctions / 4						X	2.4.16 - Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.	3.5	1
000025 Loss of RHR System / 4			X				AK3.03 - Immediate actions contained in EOP for Loss of RHRS	3.9	1
000027 Pressurizer Pressure Control System Malfunction / 3					X		AA2.12 - PZR level	3.7	1
000029 ATWS / 1						X	2.2.3 - (multi-unit license) Knowledge of the design, procedural, and operational differences between units.	3.8	1
000038 Steam Gen. Tube Rupture / 3			X				EK3.08 - Criteria for securing RCP	4.1	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4		X					AK2.02 - Sensors and detectors	2.6*	1
000055 Station Blackout / 6				X			EA1.01 - In-core thermocouple temperatures	3.7	1
000056 Loss of Off-site Power / 6	X						AK1.04 - Definition of saturation conditions, implication for the systems	3.1*	1
000057 Loss of Vital AC Inst. Bus / 6				X			AA1.02 - Manual control of PZR level	3.8	1
000058 Loss of DC Power / 6					X		AA2.03 - DC loads lost; impact on to operate and monitor plant systems	3.5	1
000062 Loss of Nuclear Svc Water / 4			X				AK3.03 - Guidance actions contained in EOP for Loss of nuclear service water	4.0	1
000065 Loss of Instrument Air / 8						X	2.2.2 - Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4.6	1
000077 Generator Voltage and Electric Grid Disturbances / 6				X			AA1.03 - Voltage regulator controls	3.8	1
CE/E02 Reactor Trip - Stabilization - Recovery / 1					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.0	1

**PWR RO Examination Outline**

Printed: 08/22/2008

Facility: PVNGS

ES - 401

**Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1**

**Form ES-401-2**

<b>E/APE # / Name / Safety Function</b>	<b>K1</b>	<b>K2</b>	<b>K3</b>	<b>A1</b>	<b>A2</b>	<b>G</b>	<b>KA Topic</b>	<b>Imp.</b>	<b>Points</b>
CE/E06 Loss of Main Feedwater / 4	X						EK1.2 - Normal, abnormal and emergency operating procedures associated with (Loss of Feedwater)	3.2	1
<b>K/A Category Totals:</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>Group Point Total:</b>	<b>18</b>	

**PWR RO Examination Outline**

Printed: 08/22/2008

Facility: PVNGS

ES - 401

**Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2**

**Form ES-401-2**

<b>E/APE # / Name / Safety Function</b>	<b>K1</b>	<b>K2</b>	<b>K3</b>	<b>A1</b>	<b>A2</b>	<b>G</b>	<b>KA Topic</b>	<b>Imp.</b>	<b>Points</b>
000001 Continuous Rod Withdrawal / 1		X					AK2.01 - Rod bank step counters	2.9	1
000024 Emergency Boration / 1	X						AK1.02 - Relationship between boron addition and reactor power	3.6	1
000032 Loss of Source Range NI / 7			X				AK3.01 - Startup termination on source-range loss	3.2	1
000036 Fuel Handling Accident / 8	X						AK1.01 - Radiation exposure hazards	3.5	1
000060 Accidental Gaseous Radwaste Rel. / 9				X			AA1.01 - Area radiation monitors	2.8	1
000069 Loss of CTMT Integrity / 5		X					AK2.03 - Personnel access hatch and emergency access hatch	2.8*	1
000076 High Reactor Coolant Activity / 9						X	2.4.47 - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	1
CE/A11 RCS Overcooling - PTS / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.0	1
CE/A16 Excess RCS Leakage / 2			X				EK3.3 - Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations	3.3	1
<b>K/A Category Totals:</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>Group Point Total:</b>	<b>9</b>	

PWR RO Examination Outline

Printed: 08/22/2008

Facility: PVNGS

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
003 Reactor Coolant Pump					X							K5.02 - Effects of RCP coastdown on RCS parameters	2.8	1
003 Reactor Coolant Pump										X		A4.02 - RCP motor parameters	2.9	1
004 Chemical and Volume Control							X					A1.12 - Rate of boron concentration reduction in RCS as a function of letdown flow while deborating demineralizer is in service	2.8	1
005 Residual Heat Removal										X		A4.03 - RHR temperature, PZR heaters and flow, and nitrogen	2.8*	1
005 Residual Heat Removal		X										K2.03 - RCS pressure boundary motor-operated valves	2.7*	1
006 Emergency Core Cooling						X						K6.13 - Pumps	2.8	1
007 Pressurizer Relief/Quench Tank					X							K5.02 - Method of forming a steam bubble in the PZR	3.1	1
008 Component Cooling Water								X				A2.04 - PRMS alarm	3.3	1
010 Pressurizer Pressure Control						X						K6.03 - PZR sprays and heaters	3.2	1
010 Pressurizer Pressure Control											X	2.4.9 - Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.	3.8	1
012 Reactor Protection	X											K1.06 - T/G	3.1*	1
013 Engineered Safety Features Actuation				X								K4.06 - Recirculation actuation system reset	4.0*	1
022 Containment Cooling	X											K1.04 - Chilled water	2.9*	1
022 Containment Cooling											X	2.2.41 - Ability to obtain and interpret station electrical and mechanical drawings.	3.5	1
026 Containment Spray			X									K3.01 - CCS	3.9	1
039 Main and Reheat Steam										X		A4.07 - Steam dump valves	2.8*	1
059 Main Feedwater				X								K4.16 - Automatic trips for MFW pumps	3.1*	1
061 Auxiliary/Emergency Feedwater								X				A2.05 - Automatic control malfunction	3.1*	1
061 Auxiliary/Emergency Feedwater				X								K4.12 - Natural circulation flow	3.5*	1
062 AC Electrical Distribution								X				A2.05 - Methods for	2.9	1

**PWR RO Examination Outline**

Printed: 08/22/2008

Facility: PVNGS

ES - 401

**Plant Systems - Tier 2 / Group 1**

**Form ES-401-2**

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic energizing a dead bus	Imp.	Points
063 DC Electrical Distribution		X										K2.01 - Major DC loads	2.9*	1
064 Emergency Diesel Generator	X											K1.03 - Diesel fuel oil supply system	3.6	1
073 Process Radiation Monitoring							X					A1.01 - Radiation levels	3.2	1
076 Service Water							X					A1.02 - Reactor and turbine building closed cooling water temperatures	2.6*	1
076 Service Water			X									K3.05 - RHR components, controls, sensors, indicators, and alarms, including rad monitors	3.0*	1
078 Instrument Air									X			A3.01 - Air pressure	3.1	1
103 Containment									X			A3.01 - Containment isolation	3.9	1
103 Containment			X									K3.03 - Loss of containment integrity under refueling operations	3.7	1
<b>K/A Category Totals:</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>Group Point Total:</b>		<b>28</b>

PWR RO Examination Outline

Printed: 08/22/2008

Facility: PVNGS

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
001 Control Rod Drive		X										K2.01 - One-line diagram of power supply to M/G sets	3.5	1
002 Reactor Coolant						X						K6.07 - Pumps	2.5	1
015 Nuclear Instrumentation			X									K3.04 - ICS	3.4*	1
034 Fuel Handling Equipment							X					A1.02 - Water level in the refueling canal	2.9	1
035 Steam Generator				X								K4.01 - S/G level control	3.6	1
045 Main Turbine Generator					X							K5.23 - Relationship between rod control and RCS boron concentration during T/G load increases	2.7	1
055 Condenser Air Removal									X			A3.03 - Automatic diversion of CARS exhaust	2.5*	1
056 Condensate	X											K1.03 - MFW	2.6*	1
072 Area Radiation Monitoring											X	2.1.4 - Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc.	3.3	1
075 Circulating Water								X				A2.03 - Safety features and relationship between condenser vacuum, turbine trip, and steam dump	2.5	1
<b>K/A Category Totals:</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>Group Point Total:</b>	<b>10</b>									

# Generic Knowledge and Abilities Outline (Tier 3)

## PWR RO Examination Outline

Printed: 08/22/2008

**Facility:** PVNGS

**Form ES-401-3**

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
<b>Conduct of Operations</b>	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
	2.1.27	Knowledge of system purpose and/or function.	3.9	1
	2.1.34	Knowledge of primary and secondary plant chemistry limits.	2.7	1
	<b>Category Total:</b>			<b>3</b>
<b>Equipment Control</b>	2.2.21	Knowledge of pre- and post-maintenance operability requirements.	2.9	1
	2.2.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	1
	<b>Category Total:</b>			<b>2</b>
<b>Radiation Control</b>	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	1
	2.3.13	Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.4	1
	<b>Category Total:</b>			<b>2</b>
<b>Emergency Procedures/Plan</b>	2.4.5	Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.	3.7	1
	2.4.26	Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage.	3.1	1
	2.4.32	Knowledge of operator response to loss of all annunciators.	3.6	1
	<b>Category Total:</b>			<b>3</b>

**Generic Total: 10**



PWR SRO Examination Outline

Facility: PVMNGS

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

ES - 401

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp. Points
000009 Small Break LOCA / 3						X	2.4.44 - Knowledge of emergency plan protective action recommendations.	4.4
000011 Large Break LOCA / 3						X	2.4.20 - Knowledge of operational implications of EOP warnings, cautions, and notes.	4.3
000025 Loss of RHR System / 4						X	2.1.25 - Ability to interpret reference materials, such as graphs, curves, tables, etc.	4.2
000056 Loss of Off-site Power / 6						X	AA2.09 - Operational status of reactor building cooling unit	2.9
CE/E02 Reactor Trip - Stabilization - Recovery / 1						X	EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	4.0
CE/E06 Loss of Main Feedwater / 4						X	EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	4.2
<b>K/A Category Totals:</b>								
	0	0	0	0	0	3		
<b>Group Point Total:</b>								<b>6</b>

PWR SRO Examination Outline

Facility: PVNGS

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points	K/A Category Totals:									
										0	0	0	0	2	2				
000051 Loss of Condenser Vacuum / 4							X 2.3.14 - Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.		3.8	1									
000069 Loss of CTMT Integrity / 5							AA2.01 - Loss of containment integrity		4.3	1									
CE/A16 Excess RCS Leakage / 2							EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments		3.7	1									
CE/E09 Functional Recovery							2.3.6 - Ability to approve release permits.		3.8	1									
Group Point Total:										4									

PWR SRO Examination Outline

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp. Points
012 Reactor Protection							X					A2.03 - Incorrect channel bypassing	3.7
026 Containment Spray											X	2.4.38 - Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required.	4.4
059 Main Feedwater							X					A2.12 - Failure of feedwater regulating valves	3.4*
063 DC Electrical Distribution										X		2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm.	4.3
078 Instrument Air							X					A2.01 - Air dryer and filter malfunctions	2.9
K/A Category Totals:													5
Group Point Total:													5

PWR SRO Examination Outline

Facility: PVNGS

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

Printed: 09/25/2008

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
015 Nuclear Instrumentation								X				A2.01 - Power supply loss or erratic operation	3.9	1
035 Steam Generator											X	2.1.20 - Ability to interpret and execute procedure steps.	4.6	1
041 Steam Dump/Turbine Bypass Control								X				A2.02 - Steam valve stuck open	3.9	1
<b>K/A Category Totals:</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>		<b>Group Point Total: 3</b>							

Generic Knowledge and Abilities Outline (Tier 3)

PWR SRO Examination Outline

Printed: 09/25/2008

Facility: PVNGS

Form ES-401-3

Generic Category KA KA Topic Imp. Points

Conduct of Operations	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.7	1
	2.1.37	Knowledge of procedures, guidelines, or limitations associated with reactivity management	4.6	1
Category Total: 2				

Equipment Control	2.2.37	Ability to determine operability and/or availability of safety related equipment	4.6	1
	2.2.39	Knowledge of less than or equal to one hour Technical Specification action statements for systems.	4.5	1
Category Total: 2				

Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions	3.7	1
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities	3.8	1
Category Total: 2				

Emergency Procedures/Plan	2.4.8	Knowledge of how abnormal operating procedures are used in conjunction with EOPs	4.5	1
	Category Total: 1			

Generic Total: 7

PVNGS License Examination  
Record of Rejected K/As (06/05/08)

Exam Date 11/07/08

PVNGS Form  
ES-401-4

Tier / Group	Randomly Selected K/As	Reason for Rejection
<b>RO Exam</b>		
1/1	4.2-015/017 2.2.35	Ability to determine the TS mode of Operation as it applies to AOP, RCP Motor Emergencies.  <b>There is no reasonable connection</b>
	4.2-015/017 2.4.16	Knowledge of EOP implementation hierarchy and coordination with other  support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.
1/1	4.2-057 2.2.1	Ability to perform pre-startup procedures including systems that affect reactivity as it applies to a loss of Vital AC Instrument Bus  <b>I could not develop a discriminating question</b>
	4.2-057 AA1.02	Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bus: Manual control of PZR level.
1/1	4.2-065-AA1.03	Restoration of systems served by IA when pressure is regained  <b>Our AOP has no guidance in this area, I could not develop a discriminating question</b>
	4.2-065 2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.  (as it applies to Loss of Instrument Air)
1/2	4.2-061-AK2.01	Detectors at each ARM system location as it applies to ARM system alarms  <b>Not Operational significant</b>
	4.2-001-AK2.01	Knowledge of the interrelations between the Continuous Rod Withdrawal and the following: Rod bank step counters
1/2	4.2-068-AA2.10	Source Range Count Rate as it applies to AOP, Control Room evacuation  <b>Unable to monitor CR outside the CR, I could not develop a discriminating question</b>
	4.4-A16-AK3.3	Manipulation of controls required to obtain desired operating results during abnormal and emergency situations.  (as it applies to Excess RCS Leakage)

2/1	3.6-062-A2.12	Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:  Restoration of power to a system with a fault  <b>I could not develop a discriminating question</b>
	3.4-005-A4.03	Ability to manually operate and/or monitor in the control room: RHR temperature, PZR heaters and flow, and nitrogen
2/2	3.1-001-K4.06	Indication of what caused Reactor Trip (first out panel) as it relates to Control Rod Drive.  <b>This should be suppressed, CRD system does not have an input to first out panel</b>
	3.1-001-K2.01	Knowledge of bus power supplies to the following: One-line diagram of power supply to M/G sets.
2/2	3.4-041-A4.06	Atmospheric Relief Valve controllers as it applies to Steam Dump/Turbine Bypass control  <b>Q43 of RO exam already tests this concept</b>
2/2	3.8-075-K2.03	Emergency/essential SWS pumps as it applies to Circulating Water  <b>There is no connection at PVNGS, we need to suppress this one</b>
	3.8-075-A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the circulating water system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:  Safety features and relationship between condenser vacuum, turbine trip, and steam dump
3	2.2.36	Ability to analyze the effect of maintenance activities on LCOs  <b>I could not develop an RO level discriminating question</b>
	2.1.27	Knowledge of system purpose and/or function.

PVNGS License Examination  
Record of Rejected K/As (06/05/08)

Exam Date 11/07/08

PVNGS Form  
ES-401-4

Tier / Group	Randomly Selected K/As	Reason for Rejection
<b>SRO Exam</b>		
1/1	4.2-065 2.1.13	Knowledge of facility requirements for controlling vital/controlled access. (as it applies to a Loss Of Instrument Air).  <b>There was no reasonable question linking these 2 items.</b>
	4.1-011 2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes.  (as it applies to Large Break LOCA)
1/2	4.2-033 2.4.4	Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures. (as it applies to a Loss of Intermediate range NI).  <b>We have no AOP/EOP entry level conditions that include Intermediate Range NIs.</b>
	4.4-E09 2.3.6	Ability to approve release permits. (as it applies to the Functional Recovery Procedure).
2/1	3.8-008-A2.08	Effects of shutting (automatically or otherwise) the isolation valves of the letdown cooler.  <b>I could not develop a good SRO level question.</b>
	3.4-059-A2.12	Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:  Failure of feedwater regulating valves
2/2	3.8-033 2.2.37	Ability to determine operability and/or availability of safety related equipment. (as it applies to the Spent Fuel Cooling System).  <b>We used this combination on the 2007 NRC exam and a similar question is on the 2008 audit.</b>
	3.4-035 2.1.20	Ability to interpret and execute procedure steps (as it applies to Steam Generator)

2/2	3.8-034-A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the Fuel Handling System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Dropped cask  <b>All an SRO would do is to implement the AOP, could not develop a good question.</b>
	3.4-041-A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the SDS; and (b) based on those predictions or mitigate the consequences of those malfunctions or operations: Steam valve stuck open
3	2.3.5	Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.  <b>Could not develop a good SRO question on the ability to use Rad Monitors</b>
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.
3	2.4.27	Knowledge of "fire in the plant" procedures.  <b>This KA is being used on the audit exam.</b>
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.