

**Revision 2**

Facility: <u>CPSES</u>		Date of Examination: <u>11/2002</u>
Examination Level: <u>RO</u>		Operating Test Number: _____
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations	<b>ROA1 (BANK)</b> -G2.1.20 Ability to execute procedure steps. (3.9/4.0) --Perform a Quadrant Power Tilt Ratio Calculation
	Conduct of Operations	<b>ROA2 (NEW)</b> -G2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. (2.8/3.1) --Given the plant data, Calculate an RCS Leak Rate
A.2	Equipment Control	<b>ROA3 (NEW)</b> -G2.2.13 Knowledge of tagging and clearance procedures. (3.6/3.8) --Identify errors in faulted tag
A.3	Radiation Control	<b>ROA4 (NEW)</b> -G2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. (2.9/3.3) --Interpret a Survey Map and Answer 2 Questions about it.
A.4	Emergency Plan	<b>ROA5.1 (NEW)</b> -G2.4.39 Knowledge of RO's responsibilities in emergency plan implementation. (3.3/3.1) -Question from the general training plan
		<b>ROA5.2 (NEW)</b> -G2.4.39 Knowledge of RO's responsibilities in emergency plan implementation. (3.3/3.1) -Question from the general training plan

**Revision 2**

Facility: <u>CPSES</u>		Date of Examination: <u>11/2002</u>
Examination Level: <u>SRO</u>		Operating Test Number: _____
Administrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions	
A.1	Conduct of Operations	<b>SROA1(BANK)</b> -G2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. (3.9/4.0) --Perform Shutdown Margin Calculation
	Conduct of Operations	<b>SROA2(NEW)</b> -G2.1.25 Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data. (2.8/3.1) --Review a Faulted Calorimetric Calculation
A.2	Equipment Control	<b>SROA3(NEW)</b> -G2.2.13 Knowledge of tagging and clearance procedures. (3.6/3.8) --Identify errors in faulted tag
A.3	Radiation Control	<b>SROA4(NEW)</b> -G2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. (2.9/3.3) --Interpret a Survey Map and Answer 2 Questions about it.
A.4	Emergency Plan	<b>SROA5.1(MODIFIED)</b> -G2.4.41 Knowledge of EAL thresholds and classifications. (2.3/4.1) --Following Scenario-1, classify the event and make protective action recommendation.
		<b>SROA5.2(MODIFIED)</b> -G2.4.41 Knowledge of EAL thresholds and classifications. (2.3/4.1) --Following Scenario-2, classify the event and make protective action recommendation.

**Revision 2**

ES-301 Control Room Systems and Facility Walk-Through Test Outline Form ES-301-2

Facility: <u>CPSES</u>	Date of Examination: <u>11/2002</u>	
Exam Level: <u>RO/SRO(I)</u>	Operating Test No.: _____	
<b>B.1 Control Room Systems</b>		
System / JPM Title	Type Code*	Safety Function
a. <b>JPMS1:</b> Reactor Coolant Pump / Start and Stop a RCP	D, S, A, L	4 (Primary)
b. <b>JPMS2:</b> CCS / Restore CCS after SI	D, S, L	5
c. <b>JPMS3:</b> CVCS / Rx M/U Water Malfunction	D, S, A	1
d. <b>JPMS4:</b> CCW / Shift CCW pumps, CCW pump trip	M, S, A	8
e. <b>JPMS5:</b> NIS / Respond to IR NIS Malfunction	D, C, L, A	7
f. <b>JPMS6:</b> ECCS / Fill SI Accumulators	M, C, A	2
g. <b>JPMS1:</b> PZR Pressure Control / Place Failed Pressurizer Pressure Channel in Trip Condition	D, C	3
<b>B.2 Facility Walk-Through</b>		
a. <b>JPMP1:</b> Fire Protection / PEO #1 actions to achieve hot shutdown after fire in the control room	D, P, L, R	8
b. <b>JPMP2:</b> Main Steam and MFW / Locally Isolate a Ruptured S/G	D, P, L	4 (Secondary)
c. <b>JPMP3:</b> EDG / Perform a Local Emergency Start of a DG	D, P, R	6
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA		

**Revision 2**

Facility: <u>CPSES</u>	Date of Examination: <u>11/2002</u>	
Exam Level: <u>SRO(U)</u>	Operating Test No.: _____	
<b>B.1 Control Room Systems</b>		
System / JPM Title	Type Code*	Safety Function
a. <b>JPMS5:</b> NIS / Respond to IR NIS Malfunction	D, C, L, A	7
b. <b>JPMS6:</b> ECCS / Fill SI Accumulators	M, C, A	2
c.		
d.		
e.		
f.		
g.		
<b>B.2 Facility Walk-Through</b>		
a. <b>JPMP1:</b> Fire Protection / PEO #1 actions to achieve hot shutdown after fire in the control room	D, P, L, R	8
b. <b>JPMP2:</b> Main Steam and MFW / Locally Isolate a Ruptured S/G	D, P, L	4 (Secondary)
c. <b>JPMP3:</b> EDG / Perform a Local Emergency Start of a DG	D, P, R	6
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA		

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Appendix D

Scenario Outline

Form ES-D-1

Facility:	<b>CPSES</b>	Scenario No.:	<b>1</b>	Op-Test No.:	<b>11/2002</b>
Examiners:	Howard Bundy	Operators:			
	Mike Murphy				
	Tom McKernon				
	Fred Sanchez				
Note:	<b>(NEW) SRO Admin A.5-1, Emerg. Class. with this Scenario (SAE).</b>				
Initial Conditions:	Full power steady state; BOL; Equilibrium Xenon; EDG 1-01 is out of service for maintenance (12 hours into LCO). (IC Info.: IC-15, EGR06 - DG1 out of service with sw. in "pull out") (PRELOAD - MET Tower Data -> wind from 180)				
Turnover:	The plant has been at 100% power for the last 15 days. Severe thunderstorm warning and high winds issued and ABN-907, Sec. 5 completed. Maintenance has been trouble shooting problems with the 1-01 HTR Drain Pump, and requests the pump be secured within the next 2 hours. Management has directed a power reduction to 70% at 15%/hour to support securing the 1-01 HTR Drain Pump. EDG 1-01 is out of service for maint., and OPT-215 was completed 1 hr ago.				
Event No.	Malf. No.	Event Type*	Event Description		
1 T=0		N (SRO) R (RO) N (BOP)	Reduce power to 70%		
2 (Cue) T=12	RX05A	I (SRO) I (RO)	Pressurizer level transmitter LT-459 fails low [value=0, ramp over 1 min] (NOTE: initiate Event 2 on Chief Examiner's cue)		
3 T=22	TC05A	C (SRO) C (BOP)	#1 Main turbine control valve fails closed (NOTE: initiate Event 3 prior to completion of actions for Event 2)		
4 T=32	ED06G	C (ALL)	Loss of 1D3 bus		
5 (Cue) T=40  T=44	RC03D	C (RO) C (SRO)	RCP 4 vibration - initial severity @ 9 mils and ramp severity to 25 mils over 6 min. High vib. alarm on RCP 4 (shaft) alarms at 15 mils & increasing @ approx 3 mils/min. (NOTE: must provide cue for vibration monitor readings - increasing at 3 mils/min - when applicant goes to look)  Manual Rx Scram due to high RCP 1-04 vibrations, no SI. Enter EOP-0.0A and then transition to EOS-0.1A.		
6 T=49	ED01	M (ALL)	Lighting strike in switchyard - loss of offsite power. EDG 1-02 starts and loads (NOTE: E6 to be initiated 5 minutes after RX Trip) (NOTE to Simulator Operator: Call RO and report lighting strike in switchyard and high winds with wind speed of 105 mph (sustained))		
7 T=E6+3	EG07B	C (ALL)	EDG 1-02 trips (overspeed) - loss of all power. Transition to ECA-0.0A and possibly ABN-601.		

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

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Appendix D	Scenario Outline	Form ES-D-1	
Facility: <b>CPSES</b>	Scenario No.: <b>2</b>	Op-Test No.: <b>11/2002</b>	
Examiners: Howard Bundy	Operators: _____		
Mike Murphy	_____		
Tom McKernon	_____		
Fred Sanchez	_____		
Note: (NEW) <b>SRO Admin A.5-2, Emerg. Class. with this Scenario (SAE).</b>			
Initial Conditions: 75% power and steady; BOL. <i>(IC-14; RP01 - Failure of automatic RX trip; RP13C - Manual RX trip failure &lt;both&gt;; TC07C - Automatic main turbine trip failure &lt;both&gt;; Fault 1B4 to prevent manual RX trip by de-energizing the bus)</i>			
Turnover: The previous shift just completed turbine valve testing and the shift has been directed to return to 100% (8%/hr< rate of increase <10%/hr). Diesel Generator 1 should be returned to service in about 2 hours. OPT-215 was completed on DG-1 1 hr ago.			
Event No.	Malf. No.	Event Type*	Event Description
1 T=0		N (SRO) R (RO) N (BOP)	Increase reactor power back to 100%
2 (Cue) T=10	RX04C	I (SRO) I (RO)	S/G 3 Level Transmitter LT-553 fails low <i>(If RO or BOP goes to place bistables in trip, start E3)</i>
3 T=19	TP04A	C (SRO) C (RO)	Main Feedwater pump A TPCW blockage [value=100%, ramp over 5 min]
**4 T=27	FW03B RP01	C (ALL) M (ALL)	Feedwater pump B trips; failure of automatic and manual reactor trip; failure of automatic main turbine trip.
***5	SG01C	M (ALL)	S/G#4 tube rupture [value=750 gpm, insert when reactor is tripped]

\* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor  
 \*\* = insert in conjunction with S/D or trip of "A" MFP  
 \*\*\* = insert when reactor is tripped.

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Appendix D	Scenario Outline	Form ES-D-1	
Facility:	<b>CPSES</b>	Scenario No.: <b>3</b> Op-Test No.: <b>11/2002</b>	
Examiners:	Howard Bundy	Operators:	
	Mike Murphy		
	Tom McKernon		
	Fred Sanchez		
Note: (BANK) This scenario is an unused spare from the 2001 CPSES exam			
Initial Conditions: 30% power and steady. (IC-11)			
Turnover: No equipment is out of service. Train A equipment is in service. FWP repairs have been completed by the previous shift. You have been directed to return to 100% power @8%/hr not to exceed 10%/hr. Start at IPO-003A step 5.4.10 and SOP-308A step 5.1.20 for the power increase.			
Event No.	Malf. No.	Event Type*	Event Description
1 T=0		N (SRO) N (BOP) R (RO)	Increase Reactor power back to 100%
2 (Cue) T=13	MS13A	I (RO) I (BOP) I (SRO)	MSL 1 Press Instrument PI-2325 fails high (100%)
3 T=16	RX08A	I (RO) I (SRO)	PZR press transmitter PT-455 fails at 2300# (ramps over 45 seconds)
4 T=16	RX15A	C (RO) C (SRO)	PZR spray flow control valve failure (PCV-455B) @ 70% severity. Failure occurs at the instant that the RO takes pressure control to manual. (Removing faulty card - PCV-455B CTRL (RXR96) - allows spray valve to go back to closed)
5 T=22	FW16	C (RO) C (BOP) C (SRO)	Lowering vacuum on main condenser due to loss of vacuum breaker water seal (5% severity)
6 T=35	TC06C MS07A MS10A1 @100%	M (ALL) M (ALL)	Main turbine spurious trip <u>and</u> MSIV #1 closes causing SG1 Safety MS-021 to fail open

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

TIER	GROUP	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	G1	G2	G3	G4	Total
1																	
	1	3	1	2				5	3			1					15
	2	2	3	5				2	5			1					18
	3							2	2								4
		5	4	7				9	10			2					37
2																	
	1	6		2	3			1	2	4	3	1	1				23
	2	1	1	2	6	1		1	3	2	1	1					19
	3	2	1		2	1	1		1								8
		9	2	4	11	2	2	3	8	5	2	2					50
3																	
	1												3				3
	2													4			4
	3														2		2
	4															4	4
																	13

1. Ensure that at least two topics from every K/A are sampled within each tier (i.e., 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 exam must total 100 points.
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 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 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.



TIER	GROUP	Category		GROUP_Total	TIER_Total
1	1	A1	5		
		A2	3		
		G	1		
		K1	3		
		K2	1		
		K3	2		
				15	
1	2	A1	2		
		A2	5		
		G	1		
		K1	2		
		K2	3		
		K3	5		
				18	
1	3	A1	2		
		A2	2		
				4	
					<b>Tier Total: 37</b>
2	1	A1	2		
		A2	4		
		A3	3		
		A4	1		
		G	1		
		K1	6		
		K3	2		
		K4	3		
		K6	1		
				23	
2	2	A1	1		
		A2	3		
		A3	2		
		A4	1		
		G	1		
		K1	1		
		K2	1		
		K3	2		
		K4	6		
		K5	1		
				19	
2	3	A2	1		
		K1	2		
		K2	1		
		K4	2		
		K5	1		
		K6	1		

8

<i>TIER</i>	<i>GROUP</i>	<i>Category</i>		<i>GROUP_Total</i>	<i>Tier Total: 50</i> <i>TIER_Total</i>
3	1	G1	3	3	
3	2	G2	4	4	
3	3	G3	2	2	
3	4	G4	4	4	
					<i>Tier Total: 13</i>

Check of Tier Totals

1	A1	9	Sat
1	A2	10	Sat
1	G	2	Sat
1	K1	5	Sat
1	K2	4	Sat
1	K3	7	Sat
2	A1	3	Sat
2	A2	8	Sat
2	A3	5	Sat
2	A4	2	Sat
2	G	2	Sat
2	K1	9	Sat
2	K2	2	Sat
2	K3	4	Sat
2	K4	11	Sat
2	K5	2	Sat
2	K6	2	Sat
3	G1	3	Sat
3	G2	4	Sat
3	G3	2	Sat
3	G4	4	Sat

## ES401-4 OUTLINE

Tier	<b>1</b>	Group 1		
		A1		
	RO#1	4.1.074	Inadequate Core Cooling	
		4.1.074.EA1.24	Ability to operate and monitor the following as they apply to a Inadequate Core Cooling: Turbine bypass valve hand/automatic controls, indicators, and setpoints	3.6 1
	RO#2	4.1.074	Inadequate Core Cooling	
		4.1.074.EA1.26	Ability to operate and monitor the following as they apply to a Inadequate Core Cooling: Reactor building emergency sump isolation valve control switches and indicators	3.8 1
	RO#3	4.2.005	Inoperable/Stuck Control Rod	
		4.2.005.AA1.05	Ability to operate and / or monitor the following as they apply to the Inoperable / Stuck Control Rod: RPI	3.4 1
	RO#4	4.2.067	Plant Fire on Site	
		4.2.067.AA1.05	Ability to operate and / or monitor the following as they apply to the Plant Fire on Site: Plant and control room ventilation systems	3 1
	RO#5	4.2.068	Control Room Evacuation	
		4.2.068.AA1.14	Ability to operate and / or monitor the following as they apply to the Control Room Evacuation: Reactor trip breakers and switches	4.2 1
		A2		
	RO#6	4.2.068	Control Room Evacuation	
		4.2.068.AA2.10	Ability to determine and interpret the following as they apply to the Control Room Evacuation: Source range count rate	4.2 1
	RO#7	4.2.076	High Reactor Coolant Activity	
		4.2.076.AA2.03	Ability to determine and interpret the following as they apply to the High Reactor Coolant Activity: RCS radioactivity level meter	2.5 1
	RO#8	4.2.076	High Reactor Coolant Activity	
		4.2.076.AA2.04	Ability to determine and interpret the following as they apply to the High Reactor Coolant Activity: Process effluent radiation chart recorder	2.6 1
		G		
	RO#9	4.2.027G	Generic KA for Pressurizer Pressure Control System Malfunction : 2.4.2 Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	3.9 1
		K1		
	RO#10	4.1.055	Station Blackout	
		4.1.055.EK1.02	Knowledge of the operational implications of the following concepts as they apply to the Station Blackout : Natural	4.1 1
	RO#11	4.2.067	Plant Fire on Site	
		4.2.067.AK1.01	Knowledge of the operational implications of the following concepts as they apply to Plant Fire on Site: Fire	2.9 1
	RO#13	4.5.E09	Natural Circulation Operations	
		4.5.E09.EK1.02	Knowledge of the operational implications of the following concepts as they apply to the (Natural Circulation Operations) Normal, abnormal and emergency operating procedures associated with (Natural Circulation Operations).	3.3 1
		K2		
	RO#14	4.2.068	Control Room Evacuation	
		4.2.068.AK2.03	Knowledge of the interrelations between the Control Room Evacuation and the following: Controllers and positioners	2.9 1

K3

RO#15	4.2.051	Loss of Condenser Vacuum		
	4.2.051.AK3.01	Knowledge of the reasons for the following responses as they apply to the Loss of Condenser Vacuum: Loss of steam dump capability upon loss of condenser vacuum	2.8	1
RO#16	4.5.E07	Saturated Core Cooling		
	4.5.E07.EK3.01	Knowledge of the reasons for the following responses as they apply to the (Saturated Core Cooling) Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.	3.1	1

Tier **1** Group **2**

A1

RO#17	4.1.029	Anticipated Transient Without Scram (ATWS)		
	4.1.029.EA1.03	Ability to operate and monitor the following as they apply to a ATWS: Charging pump suction valves from VCT operating switch	3.5	1
RO#18	4.5.E02	SI Termination		
	4.5.E02.EA1.01	Ability to operate and / or monitor the following as they apply to the (SI Termination) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	4	1

A2

RO#19	4.5.E02	SI Termination		
	4.5.E02.EA2.01	Ability to determine and interpret the following as they apply to the (SI Termination) Facility conditions and selection of appropriate procedures during abnormal and emergency	3.3	1
RO#20	4.1.009	Small Break LOCA		
	4.1.009.EA2.01	Ability to determine or interpret the following as they apply to a small break LOCA: Actions to be taken, based on RCS temperature and pressure, saturated and superheated	4.2	1
RO#21	4.2.061	Area Radiation Monitoring (ARM) System Alarms		
	4.2.061.AA2.03	Ability to determine and interpret the following as they apply to the Area Radiation Monitoring (ARM) System Alarms: Setpoints for alert and high alarms	3	1
RO#61	4.2.022	Loss of Reactor Coolant Makeup		
	4.2.022.AA2.03	Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Pump Makeup: Failures of flow control valve or controller	3.6	1
RO#22	4.1.038	Steam Generator Tube Rupture		
	4.1.038.EA2.11	Ability to determine or interpret the following as they apply to a SGTR: Local radiation reading on main steam lines	3.7	1

G

RO#23	4.1.011G	Generic KA for Large Break LOCA : 2.4.18 Knowledge of the specific bases for EOPs.	2.7	1
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K1

RO#24	4.5.E02	SI Termination		
	4.5.E02.EK1.02	Knowledge of the operational implications of the following concepts as they apply to the (SI Termination) Normal, abnormal and emergency operating procedures associated with (SI Termination)	3.4	1
RO#25	4.5.E04	LOCA Outside Containment		
	4.5.E04.EK1.01	Knowledge of the operational implications of the following concepts as they apply to the (LOCA Outside Containment) Components, capacity, and function of emergency systems.	3.5	1

K2

RO#26	4.5.E01	Rediagnosis		
	4.5.E01.EK2.01	Knowledge of the interrelations between the (Reactor Trip or Safety Injection/Rediagnosis) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.3	1
RO#27	4.5.E01	Rediagnosis		
	4.5.E01.EK2.02	Knowledge of the interrelations between the (Reactor Trip or Safety Injection/Rediagnosis) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the	3.5	1
RO#28	4.2.001	Continuous Rod Withdrawal		
	4.2.001.AK2.05	Knowledge of the interrelations between the Continuous Rod Withdrawal and the following: Rod motion lights	2.9	1

K3

RO#29	4.5.E05	Loss of Secondary Heat Sink		
	4.5.E05.EK3.01	Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink) Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.	3.4	1
RO#30	4.5.E16	High Containment Radiation		
	4.5.E16.EK3.01	Knowledge of the reasons for the following responses as they apply to the (High Containment Radiation) Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.	2.9	1
RO#31	4.5.E01	Rediagnosis		
	4.5.E01.EK3.02	Knowledge of the reasons for the following responses as they apply to the (Reactor Trip or Safety Injection/Rediagnosis) Normal, abnormal and emergency operating procedures associated with (Reactor Trip or Safety Injection/Rediagnosis).	3	1
RO#32	4.2.008	Pressurizer Vapor Space Accident		
	4.2.008.AK3.03	Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: Actions contained in EOP for PZR vapor space accident/ LOCA	4.1	1
RO#33	4.5.E03	LOCA Cooldown and Depressurization		
	4.5.E03.EK3.04	Knowledge of the reasons for the following responses as they apply to the (LOCA Cooldown and Depressurization) RO or SRO function as a within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.	3.5	1

Tier **1** Group **3**

A1

RO#34	4.2.065	Loss of Instrument Air		
	4.2.065.AA1.05	Ability to operate and / or monitor the following as they apply to the Loss of Instrument Air: RPS	3.3	1
RO#35	4.2.028	Pressurizer Level Control Malfunction		
	4.2.028.AA1.07	Ability to operate and / or monitor the following as they apply to the Pressurizer Level Control Malfunctions: Charging pumps maintenance of PZR level (including manual backup)	3.3	1

A2

RO#36	4.2.056	Loss of Off-Site Power		
	4.2.056.AA2.02	Ability to determine and interpret the following as they apply to the Loss of Offsite Power: ESF load sequencer status lights	3.5	1

	RO#12 4.2.028	Pressurizer Level Control Malfunction		
	4.2.028.AA2.01	Ability to determine and interpret the following as they apply to the Pressurizer Level Control Malfunctions: PZR level indicators and alarms	3.4	1
<b>Tier 2</b>	<b>Group 1</b>			
	A1			
	RO#37 3.7.015	Nuclear Instrumentation System		
	3.7.015.A1.08	Ability to predict and/or monitor changes in parameters to prevent exceeding design limits) associated with operating the NIS controls including: Changes in RCS temperature	3.3	1
	RO#38 3.5.022	Containment Cooling System		
	3.5.022.A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCS controls including: Containment pressure	3.6	1
	A2			
	RO#39 3.5.022	Containment Cooling System		
	3.5.022.A2.06	Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of CCS pump	2.8	1
	RO#40 3.4.059	Main Feedwater System		
	3.4.059.A2.04	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: Feeding a dry S/G	2.9	1
	RO#41 3.7.072	Area Radiation Monitoring System		
	3.7.072.A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the ARM system- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Erratic or	2.7	1
	RO#42 3.2.004	Chemical and Volume Control System		
	3.2.004.A2.19	Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: High secondary and primary concentrations of chloride, fluoride, sodium and solids	2.8	1
	A3			
	RO#43 3.4.061	Auxiliary / Emergency Feedwater System		
	3.4.061.A3.02	Ability to monitor automatic operation of the AFW, including: RCS cooldown during AFW operations	4	1
	RO#44 3.2.004	Chemical and Volume Control System		
	3.2.004.A3.12	Ability to monitor automatic operation of the CVCS, including: Interpretation of letdown demineralizer flow-divert valve position indicating lights	3	1
	RO#45 3.4.003	Reactor Coolant Pump System		
	3.4.003.A3.01	Ability to monitor automatic operation of the RCPS, including: Seal injection flow	3.3	1
	A4			
	RO#46 3.4.059	Main Feedwater System		
	3.4.059.A4.11	Ability to manually operate and monitor in the control room: Recovery from automatic feedwater isolation	3.1	1
	G			
	RO#47 3.9.068G	Generic KA for Liquid Radwaste System : 2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1

## K1

RO#48	3.7.015	Nuclear Instrumentation System		
	3.7.015.K1.03	Knowledge of the physical connections and/or cause-effect relationships between the NIS and the following systems: CRDS	3.1	1
RO#49	3.7.017	In-Core Temperature Monitor System		
	3.7.017.K1.02	Knowledge of the physical connections and/or cause effect relationships between the ITM system and the following systems: RCS	3.3	1
RO#50	3.1.001	Control Rod Drive System		
	3.1.001.K1.05	Knowledge of the physical connections and/or cause-effect relationships between the CRDS and the following systems: NIS and RPS	4.5	1
RO#51	3.7.015	Nuclear Instrumentation System		
	3.7.015.K1.01	Knowledge of the physical connections and/or cause-effect relationships between the NIS and the following systems:RPS	4.1	1
RO#52	3.4.003	Reactor Coolant Pump System		
	3.4.003.K1.01	Knowledge of the physical connections and/or cause-effect relationships between the RCPS and the following systems: RCP lube oil	2.6	1
RO#53	3.4.003	Reactor Coolant Pump System		
	3.4.003.K1.10	Knowledge of the physical connections and/or cause-effect relationships between the RCPS and the following systems: RCS	3.0	1

## K3

RO#54	3.5.022	Containment Cooling System		
	3.5.022.K3.02	Containment equipment subject to damage by high or low temperature, humidity, and pressure Containment instrumentation readings	3	1
RO#55	3.4.061	Auxiliary / Emergency Feedwater System		
	3.4.061.K3.02	Knowledge of the effect that a loss or malfunction of the AFW will have on the following: S/G	4.2	1

## K4

RO#56	3.4.061	Auxiliary / Emergency Feedwater System		
	3.4.061.K4.01	Knowledge of AFW design feature(s) and/or interlock(s) which provide for the following: Water sources and priority of use	3.9	1
RO#57	3.2.013	Engineered Safety Features Actuation System		
	3.2.013.K4.12	Knowledge of ESFAS design feature(s) and/or intelock(s) which provide for the following Safety injection block	3.7	1
RO#58	3.1.001	Control Rod Drive System		
	3.1.001.K4.23	Knowledge of CRDS design feature(s) and/or interlock(s) which provide for the following: Rod motion inhibit	3.4	1

## K6

RO#59	3.2.013	Engineered Safety Features Actuation System		
	3.2.013.K6.01	Knowledge of the effect of a loss or malfunction on the following will have on the ESFAS: Sensors and detectors	2.7	1

Tier **2** Group 2

## A1

RO#60	3.7.012	Reactor Protection System		
	3.7.012.A1.01	Ability to predict and/or monitor Changes in parameters (to prevent exceeding design limits) associated with operating the RPS controls including: Trip setpoint adjustment	2.9	1

## A2

RO#62	3.6.062	A.C. Electrical Distribution		
	3.6.062.A2.09	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: Consequences of exceeding current limitations	2.7	1



RO#63	3.7.073	Process Radiation Monitoring System			
	3.7.073.A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Erratic or	2.5	1	
RO#64	3.2.011	Pressurizer Level Control System			
	3.2.011.A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the PZR LCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of Loss of one, two or three charging pumps	3.5	1	
A3					
RO#65	3.5.026	Containment Spray System			
	3.5.026.A3.01	Ability to monitor automatic operation of the CSS, including: Pump starts and correct MOV positioning	4.3	1	
RO#66	3.4.055	Condenser Air Removal System			
	3.4.055.A3.03	Ability to monitor automatic operation of the CARS, including: Automatic diversion of CARS exhaust	2.5	1	
A4					
RO#67	3.8.029	Containment Purge System			
	3.8.029.A4.04	Ability to manually operate and/or monitor in the control room: Containment evacuation signal	3.5	1	
G					
	RO#68	3.7.012G	Generic KA for Reactor Protection System : 2.2.22 Knowledge of limiting conditions for operations and safety limits.	3.4	1
K1					
RO#69	3.7.016	Non-Nuclear Instrumentation System			
	3.7.016.K1.10	Knowledge of the physical connections and/or cause-effect relationships between the NNIS and the following systems: CCS	3.1	1	
K2					
RO#70	3.2.006	Emergency Core Cooling System			
	3.2.006.K2.02	Knowledge of bus power supplies to the following: Valve operators for accumulators	2.5	1	
K3					
RO#71	3.4.035	Steam Generator System			
	3.4.035.K3.01	Knowledge of the effect that a loss or malfunction of the S/GS will have on the following: RCS	4.4	1	
RO#72	3.7.016	Non-Nuclear Instrumentation System			
	3.7.016.K3.08	Knowledge of the effect that a loss or malfunction of the NNIS will have on the following: PZR PCS	3.5	1	
K4					
RO#73	3.4.035	Steam Generator System			
	3.4.035.K4.06	Knowledge of S/GS design feature(s) and/or interlock(s) which provide for the following: S/G System	3.1	1	
RO#74	3.8.029	Containment Purge System			
	3.8.029.K4.03	Knowledge of design feature(s) and/or interlock(s) which provide for the following: Automatic purge isolation	3.2	1	

	RO#75	3.7.073	Process Radiation Monitoring System				
		3.7.073.K4.01	Knowledge of PRM system design feature(s) and/or interlocks which provide for the following: Release termination when radiation exceeds setpoint	4	1		
	RO#76	3.8.086	Fire Protection System				
		3.8.086.K4.01	Knowledge of design feature(s) and/or interlock(s) which provide for the following: Adequate supply of water for FPS	3.1	1		
	RO#77	3.4.035	Steam Generator System				
		3.4.035.K4.05	Knowledge of S/GS design feature(s) and/or interlock(s) which provide for the following: Amount of reserve water in S/G	2.9	1		
	RO#78	3.8.086	Fire Protection System				
		3.8.086.K4.03	Knowledge of design feature(s) and/or interlock(s) which provide for the following: Detection and location of fires	3.1	1		
	K5						
	RO#79	3.3.010	Pressurizer Pressure Control System				
		3.3.010.K5.02	Knowledge of the operational implications of the following concepts as they apply to the PZR PCS: Constant enthalpy expansion through a valve	2.6	1		
Tier	<b>2</b>	Group 3					
	A2						
	RO#80	3.8.008	Component Cooling Water System				
		3.8.008.A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: PRMS alarm	3.3	1		
	K1						
	RO#81	3.4.045	Main Turbine Generator System				
		3.4.045.K1.06	Knowledge of the physical connections and/or cause-effect relationships between the MT/G system and the following systems: RCS, during steam valve test	2.6	1		
	RO#82	3.4.076	Service Water System				
		3.4.076.K1.07	Knowledge of the physical connections and/or cause-effect relationships between the SWS and the following systems: Secondary closed cooling water	2.5	1		
	K2						
	RO#83	3.4.076	Service Water System				
		3.4.076.K2.01	Knowledge of bus power supplies to the following: Service water	2.7	1		
	K4						
	RO#84	3.4.045	Main Turbine Generator System				
		3.4.045.K4.47	Knowledge of MT/G system design feature(s) and/or inter-lock(s) which provide for the following: Turbine trip upon reactor trip	4	1		
	RO#85	3.5.007	Pressurizer Relief Tank / Quench Tank System				
		3.5.007.K4.01	Knowledge of PRTS design feature(s) and/or interlock(s) which provide for the following: Quench tank cooling	F2.	1		
	K5						
	RO#86	3.5.028	Hydrogen Recombiner and Purge Control System				
		3.5.028.K5.02	Knowledge of the operational implications of the following concepts as they apply to the HRPS: Flammable hydrogen	3.4	1		
	K6						
	RO#87	3.5.028	Hydrogen Recombiner and Purge Control System				
		3.5.028.K6.01	Knowledge of the effect of a loss or malfunction on the following will have on the HRPS: Hydrogen recombiners	2.6	1		

Tier	<b>3</b>	Group 1			
		G1			
		RO#88 2.1.16	2.1.16	Conduct of Operations: Ability to operate plant phone, paging system, and two-way radio.	2.9 1
		RO#89 2.1.18	2.1.18	Conduct of Operations: Ability to make accurate, clear and concise logs, records, status boards, and reports.	2.9 1
		RO#90 2.1.24	2.1.24	Conduct of Operations: Ability to obtain and interpret station electrical and mechanical drawings.	2.8 1
Tier	<b>3</b>	Group 2			
		G2			
		RO#91 2.2.3	2.2.3	Equipment Control (multi-unit) Knowledge of the design, procedural, and operational differences between units.	3.1 1
		RO#92 2.2.22	2.2.22	Equipment Control Knowledge of limiting conditions for operations and safety limits.	3.4 1
		RO#93 2.2.23	2.2.23	Equipment Control Ability to track limiting conditions for	2.6 1
		RO#94 2.2.11	2.2.11	Equipment Control Knowledge of the process for controlling temporary changes.	2.5 1
Tier	<b>3</b>	Group 3			
		G3			
		RO#95 2.3.2	2.3.2	Radiation Control Knowledge of facility ALARA program.	2.5 1
		RO#96 2.3.4	2.3.4	Radiation Control Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5 1
Tier	<b>3</b>	Group 4			
		G4			
		RO#97 2.4.39	2.4.39	Emergency Procedures / Plan Knowledge of the RO's responsibilities in emergency plan implementation.	3.3 1
		RO#98 2.4.46	2.4.46	Emergency Procedures / Plan Ability to verify that the alarms are consistent with the plant conditions.	3.5 1
		RO#99 2.4.47	2.4.47	Emergency Procedures / Plan Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.4 1
		RO#100 2.4.25	2.4.25	Emergency Procedures / Plan Knowledge of fire protection procedures.	2.9 1

Tier/Group	Randomly Selected K/A	Reason for Rejection
1/1	4.2.005.AA1.03	Not applicable to CPSES
2/1	3.4.059.A4.10	Not applicable to CPSES
2/1	3.5.022.K1.02	Too many K/As from this system
2/1	3.5.022.K4.03	Too many K/As from this system
2/1	3.4.003.K3.03	Too many K/As from this system
2/2	3.8.079.G.2.2.22	Not applicable to CPSES
2/2	3.8.086.K5.03	Unable to generate question, and none in banks either
1/1	4.2.069.AK1.01	Unable to find/generate adequate RO quesiton
2/1	3.7.015.K1.08	Not applicable to CPSES
1/2	4.2.060.AA2.04	Unable to generate question, and none in banks either
1/2	4.2.022.AK3.03	Not applicable to CPSES
2/2	3.8.029.A2.01	Unable to find/generate adequate RO question

TIER	GROUP	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	G1	G2	G3	G4	Total
1																	
	1	6	4	3				6	4			1					24
	2	1		6				2	6			1					16
	3							1	2								3
		7	4	9				9	12			2					43
2																	
	1	3		2	3		1	2	3	3	1	1					19
	2	1	1	2	3	2	1	1	3	1	1	1					17
	3	1	1		1				1								4
		5	2	4	7	2	2	3	7	4	2	2					40
3																	
	1												6				6
	2													4			4
	3														2		2
	4															5	5
																	17

1. Ensure that at least two topics from every K/A are sampled within each tier (i.e., 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 exam must total 100 points.
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 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 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.

*ES-401.r2 PWR SRO (continued)*

*CPSES - 11/2002*

<i>TIER</i>	<i>GROUP</i>	<i>Category</i>		<i>GROUP_Total</i>	<i>TIER_Total</i>
1	1	A1	6		
		A2	4		
		G	1		
		K1	6		
		K2	4		
		K3	3		
				24	
1	2	A1	2		
		A2	6		
		G	1		
		K1	1		
		K3	6		
				16	
1	3	A1	1		
		A2	2		
				3	
					<b>Tier Total: 43</b>
2	1	A1	2		
		A2	3		
		A3	3		
		A4	1		
		G	1		
		K1	3		
		K3	2		
		K4	3		
		K6	1		
				19	
2	2	A1	1		
		A2	3		
		A3	1		
		A4	1		
		G	1		
		K1	1		
		K2	1		
		K3	2		
		K4	3		
		K5	2		
		K6	1		
				17	
2	3	A2	1		
		K1	1		
		K2	1		
		K4	1		
				4	

<i>TIER</i>	<i>GROUP</i>	<i>Category</i>		<i>GROUP_Total</i>	<i>Tier Total: 40</i> <i>TIER_Total</i>
<b>3</b>	<b>1</b>	<i>G1</i>	6	6	
<b>3</b>	<b>2</b>	<i>G2</i>	4	4	
<b>3</b>	<b>3</b>	<i>G3</i>	2	2	
<b>3</b>	<b>4</b>	<i>G4</i>	5	5	
					<i>Tier Total: 17</i>

**Check of Tier Totals**

1	A1	9	Sat
1	A2	12	Sat
1	G	2	Sat
1	K1	7	Sat
1	K2	4	Sat
1	K3	9	Sat
2	A1	3	Sat
2	A2	7	Sat
2	A3	4	Sat
2	A4	2	Sat
2	G	2	Sat
2	K1	5	Sat
2	K2	2	Sat
2	K3	4	Sat
2	K4	7	Sat
2	K5	2	Sat
2	K6	2	Sat
3	G1	6	Sat
3	G2	4	Sat
3	G3	2	Sat
3	G4	5	Sat



ES401-3 OUTLINE

Tier **1** Group 1

A1

RO/SRO#17 4.1.029	Anticipated Transient Without Scram (ATWS)		
4.1.029.EA1.03	Ability to operate and monitor the following as they apply to a ATWS: Charging pump suction valves from VCT operating switch	3.2	1
RO/SRO#1 4.1.074	Inadequate Core Cooling		
4.1.074.EA1.24	Ability to operate and monitor the following as they apply to a Inadequate Core Cooling: Turbine bypass valve hand/automatic controls, indicators, and setpoints	3.8	1
RO/SRO#4 4.2.067	Plant Fire on Site		
4.2.067.AA1.05	Ability to operate and / or monitor the following as they apply to the Plant Fire on Site: Plant and control room ventilation systems	3.1	1
RO/SRO#5 4.2.068	Control Room Evacuation		
4.2.068.AA1.14	Ability to operate and / or monitor the following as they apply to the Control Room Evacuation: Reactor trip breakers and switches	4.4	1
RO/SRO#3 4.2.005	Inoperable/Stuck Control Rod		
4.2.005.AA1.05	Ability to operate and / or monitor the following as they apply to the Inoperable / Stuck Control Rod: RPI	3.4	1
RO/SRO#18 4.5.E02	SI Termination		
4.5.E02.EA1.01	Ability to operate and / or monitor the following as they apply to the (SI Termination) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual	3.9	1

A2

RO/SRO#7 4.2.076	High Reactor Coolant Activity		
4.2.076.AA2.03	Ability to determine and interpret the following as they apply to the High Reactor Coolant Activity: RCS radioactivity	3	1
RO/SRO#6 4.2.068	Control Room Evacuation		
4.2.068.AA2.10	Ability to determine and interpret the following as they apply to the Control Room Evacuation: Source range count rate	4.4	1
RO/SRO#8 4.2.076	High Reactor Coolant Activity		
4.2.076.AA2.04	Ability to determine and interpret the following as they apply to the High Reactor Coolant Activity: Process effluent radiation chart recorder	3	1
<b>SRO ONLY</b> #19 4.5.E02	SI Termination		
4.5.E02.EA2.01	Ability to determine and interpret the following as they apply to the (SI Termination) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	4.2	1

G

RO/SRO#9 4.2.027G	Generic KA for Pressurizer Pressure Control System Malfunction : 2.4.2 Knowledge of system set points, interlocks and automatic actions associated with EOP entry	4.1	1
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K1

RO/SRO#11 4.2.067	Plant Fire on Site		
4.2.067.AK1.01	Knowledge of the operational implications of the following concepts as they apply to Plant Fire on Site: Fire classifications, by type	3.9	1

	RO/SRO#10 4.1.055	Station Blackout		
	4.1.055.EK1.02	Knowledge of the operational implications of the following concepts as they apply to the Station Blackout : Natural circulation cooling	4.4	1
	<b>SRO ONLY#73</b> 4.2.069	Loss of Containment Integrity		
	4.2.069.AK1.01	Knowledge of the operational implications of the following concepts as they apply to Loss of Containment Integrity: Effect of pressure on leak rate	3.1	1
	RO/SRO#24 4.5.E02	SI Termination		
	4.5.E02.EK1.02	Knowledge of the operational implications of the following concepts as they apply to the (SI Termination) Normal, abnormal and emergency operating procedures associated with (SI Termination).	3.9	1
	RO/SRO#25 4.5.E04	LOCA Outside Containment		
	4.5.E04.EK1.01	Knowledge of the operational implications of the following concepts as they apply to the (LOCA Outside Containment) Components, capacity, and function of emergency systems.	3.9	1
	RO/SRO#13 4.5.E09	Natural Circulation Operations		
	4.5.E09.EK1.02	Knowledge of the operational implications of the following concepts as they apply to the (Natural Circulation Operations) Normal, abnormal and emergency operating procedures associated with (Natural Circulation Operations).	3.7	1
K2				
	RO/SRO#28 4.2.001	Continuous Rod Withdrawal		
	4.2.001.AK2.05	Knowledge of the interrelations between the Continuous Rod Withdrawal and the following: Rod motion lights	3.1	1
	<b>SRO ONLY#14</b> 4.2.068	Control Room Evacuation		
	4.2.068.AK2.03	Knowledge of the interrelations between the Control Room Evacuation and the following: Controllers and positioners	3.1	1
	RO/SRO#26 4.5.E01	Rediagnosis		
	4.5.E01.EK2.01	Knowledge of the interrelations between the (Reactor Trip or Safety Injection/Rediagnosis) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.5	1
	RO/SRO#27 4.5.E01	Rediagnosis		
	4.5.E01.EK2.02	Knowledge of the interrelations between the (Reactor Trip or Safety Injection/Rediagnosis) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	3.8	1
K3				
	RO/SRO#15 4.2.051	Loss of Condenser Vacuum		
	4.2.051.AK3.01	Knowledge of the reasons for the following responses as they apply to the Loss of Condenser Vacuum: Loss of steam dump capability upon loss of condenser vacuum	3.1	1
	RO/SRO#31 4.5.E01	Rediagnosis		
	4.5.E01.EK3.02	Knowledge of the reasons for the following responses as they apply to the (Reactor Trip or Safety Injection/Rediagnosis) Normal, abnormal and emergency operating procedures associated with (Reactor Trip or Safety	3.9	1
	RO/SRO#16 4.5.E07	Saturated Core Cooling		
	4.5.E07.EK3.01	Knowledge of the reasons for the following responses as they apply to the (Saturated Core Cooling) Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.	3.7	1

Tier	1	Group 2		Imp.
	A1			
		RO/SRO#34 4.2.065	Loss of Instrument Air	
		4.2.065.AA1.05	Ability to operate and / or monitor the following as they apply to the Loss of Instrument Air: RPS	3.3 1
		<b>SRO ONLY#2</b> 4.1.038	Steam Generator Tube Rupture	
		4.1.038.EA1.37	Ability to operate and monitor the following as they apply to a SGTR: Controlling of thermal shock during PZR spray	3.4 1
	A2			
		RO/SRO#20 4.1.009	Small Break LOCA	
		4.1.009.EA2.01	Ability to determine or interpret the following as they apply to a small break LOCA: Actions to be taken, based on RCS temperature and pressure, saturated and superheated	4.8 1
		RO/SRO#22 4.1.038	Steam Generator Tube Rupture	
		4.1.038.EA2.11	Ability to determine or interpret the following as they apply to a SGTR: Local radiation reading on main steam lines	3.9 1
		RO/SRO#21 4.2.061	Area Radiation Monitoring (ARM) System Alarms	
		4.2.061.AA2.03	Ability to determine and interpret the following as they apply to the Area Radiation Monitoring (ARM) System Alarms: Setpoints for alert and high alarms	3.3 1
		<b>SRO ONLY#41</b> 4.5.E05	Loss of Secondary Heat Sink	
		4.5.E05.EA2.02	Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	4.3 1
		RO/SRO#61 4.2.022	Loss of Reactor Coolant Makeup	
		4.2.022.AA2.03	Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Pump Makeup: Failures of flow control valve or controller	3.6 1
		<b>SRO ONLY#45</b> 4.2.060	Accidental Gaseous Radwaste Release	
		4.2.060.AA2.02	Ability to determine and interpret the following as they apply to the Accidental Gaseous Radwaste: The possible location of a radioactive-gas leak, with the assistance of PEO, HP, and CHEM pers.	4.0 1
	G			
		RO/SRO#23 4.1.011G	Generic KA for Large Break LOCA : 2.4.18 Knowledge of the specific bases for EOPs.	3.6 1
	K1			
		<b>SRO ONLY#49</b> 4.5.E16	High Containment Radiation	
		4.5.E16.EK1.03	Knowledge of the operational implications of the following concepts as they apply to the (High Containment Radiation) Annunciators and conditions indicating signals, and remedial actions associated with the (High Containment Radiation).	3.3 1
	K3			
		RO/SRO#32 4.2.008	Pressurizer Vapor Space Accident	
		4.2.008.AK3.03	Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: Actions contained in EOP for PZR vapor space accident/ LOCA	4.6 1
		<b>SRO ONLY#53</b> 4.2.032	Loss of Source Range Nuclear Instrumentation	
		4.2.032.AK3.02	Knowledge of the reasons for the following responses as they apply to the Loss of Source Range Nuclear Instrumentation: Guidance contained in EOP for loss of source-range nuclear instrumentation	4.1 1

	<b>SRO ONLY#63</b>	4.5.E11	Loss of Emergency Coolant Recirculation		
		4.5.E11.EK3.02	Knowledge of the reasons for the following responses as they apply to the (Loss of Emergency Coolant Recirculation) Normal, abnormal and emergency operating procedures associated with (Loss of Emergency Coolant	4	1
	RO/SRO#33	4.5.E03	LOCA Cooldown and Depressurization		
		4.5.E03.EK3.04	Knowledge of the reasons for the following responses as they apply to the (LOCA Cooldown and Depressurization) RO or SRO function as a within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.	3.9	1
	RO/SRO#29	4.5.E05	Loss of Secondary Heat Sink		
		4.5.E05.EK3.01	Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink) Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.	3.8	1
	RO/SRO#30	4.5.E16	High Containment Radiation		
		4.5.E16.EK3.01	Knowledge of the reasons for the following responses as they apply to the (High Containment Radiation) Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.	3.1	1
Tier	<b>1</b>	Group 3			Imp.
	A1				
		RO/SRO#35	4.2.028	Pressurizer Level Control Malfunction	
			4.2.028.AA1.07	Ability to operate and / or monitor the following as they apply to the Pressurizer Level Control Malfunctions: Charging pumps maintenance of PZR level (including manual backup)	3.3 1
	A2				
		RO/SRO#12	4.2.028	Pressurizer Level Control Malfunction	
			4.2.028.AA2.01	Ability to determine and interpret the following as they apply to the Pressurizer Level Control Malfunctions: PZR level indicators and alarms	3.4 1
		RO/SRO#36	4.2.056	Loss of Off-Site Power	
			4.2.056.AA2.02	Ability to determine and interpret the following as they apply to the Loss of Offsite Power: ESF load sequencer status	3.6 1
Tier	<b>2</b>	Group 1			Imp.
	A1				
		<b>SRO ONLY#38</b>	3.5.022	Containment Cooling System	
			3.5.022.A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCS controls including: Containment pressure	3.8 1
		RO/SRO#37	3.7.015	Nuclear Instrumentation System	
			3.7.015.A1.08	Ability to predict and/or monitor changes in parameters to prevent exceeding design limits) associated with operating the NIS controls including: Changes in RCS temperature	3.4 1
	A2				

	RO/SRO#40	3.4.059	Main Feedwater System		
		3.4.059.A2.04	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: Feeding a dry S/G	3.4	1
	RO/SRO#39	3.5.022	Containment Cooling System		
		3.5.022.A2.06	Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of CCS pump	3.2	1
	RO/SRO#42	3.2.004	Chemical and Volume Control System		
		3.2.004.A2.19	Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: High secondary and primary concentrations of chloride, fluoride, sodium and solids	3.5	1
A3					
	RO/SRO#65	3.5.026	Containment Spray System		
		3.5.026.A3.01	Ability to monitor automatic operation of the CSS, including: Pump starts and correct MOV positioning	4.5	1
	RO/SRO#44	3.2.004	Chemical and Volume Control System		
		3.2.004.A3.12	Ability to monitor automatic operation of the CVCS, including: Interpretation of letdown demineralizer flow-divert valve position indicating lights	2.7	1
	RO/SRO#43	3.4.061	Auxiliary / Emergency Feedwater System		
		3.4.061.A3.02	Ability to monitor automatic operation of the AFW, including: RCS cooldown during AFW operations	4	1
A4					
	RO/SRO#46	3.4.059	Main Feedwater System		
		3.4.059.A4.11	Ability to manually operate and monitor in the control room: Recovery from automatic feedwater isolation	3.3	1
G					
	RO/SRO#47	3.9.068G	Generic KA for Liquid Radwaste System : 2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	3.1	1
K1					
	RO/SRO#50	3.1.001	Control Rod Drive System		
		3.1.001.K1.05	Knowledge of the physical connections and/or cause-effect relationships between the CRDS and the following systems: NIS and RPS	4.4	1
	RO/SRO#52	3.4.003	Reactor Coolant Pump System		
		3.4.003.K1.01	Knowledge of the physical connections and/or cause-effect relationships between the RCPS and the following systems: RCP lube oil	2.8	1
	RO/SRO#48	3.7.015	Nuclear Instrumentation System		
		3.7.015.K1.03	Knowledge of the physical connections and/or cause-effect relationships between the NIS and the following systems:	3.1	1
K3					

	RO/SRO#54 3.5.022	Containment Cooling System		
	3.5.022.K3.02	Containment equipment subject to damage by high or low temperature, humidity, and pressure Containment instrumentation readings	3.3	1
	RO/SRO#55 3.4.061	Auxiliary / Emergency Feedwater System		
	3.4.061.K3.02	Knowledge of the effect that a loss or malfunction of the AFW will have on the following: S/G	4.4	1
	K4			
	RO/SRO#58 3.1.001	Control Rod Drive System		
	3.1.001.K4.23	Knowledge of CRDS design feature(s) and/or interlock(s) which provide for the following: Rod motion inhibit	3.8	1
	RO/SRO#57 3.2.013	Engineered Safety Features Actuation System		
	3.2.013.K4.12	Knowledge of ESFAS design feature(s) and/or intelock(s) which provide for the following Safety injection block	3.9	1
	<b>SRO ONLY</b> #56 3.4.061	Auxiliary / Emergency Feedwater System		
	3.4.061.K4.01	Knowledge of AFW design feature(s) and/or interlock(s) which provide for the following: Water sources and priority of use	4.2	1
	K6			
	RO/SRO#59 3.2.013	Engineered Safety Features Actuation System		
	3.2.013.K6.01	Knowledge of the effect of a loss or malfunction on the following will have on the ESFAS: Sensors and detectors	3.1	1
Tier	<b>2</b> Group 2			Imp.
	A1			
	RO/SRO#60 3.7.012	Reactor Protection System		
	3.7.012.A1.01	Ability to predict and/or monitor Changes in parameters (to prevent exceeding design limits) associated with operating the RPS controls including: Trip setpoint adjustment	3.4	1
	A2			
	<b>SRO ONLY</b> #51 3.8.029	Containment Purge System		
	3.8.029.A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Maintenance or other activity taking place inside containment	3.6	1
	RO/SRO#62 3.6.062	A.C. Electrical Distribution		
	3.6.062.A2.09	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: Consequences of exceeding current limitations	3	1
	RO/SRO#64 3.2.011	Pressurizer Level Control System		
	3.2.011.A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the PZR LCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of Loss of one, two or three charging pumps	3.7	1
	A3			
	RO/SRO#66 3.4.055	Condenser Air Removal System		
	3.4.055.A3.03	Ability to monitor automatic operation of the CARS, including: Automatic diversion of CARS exhaust	2.7	1
	A4			

	RO/SRO#67 3.8.029	Containment Purge System		
	3.8.029.A4.04	Ability to manually operate and/or monitor in the control room: Containment evacuation signal	3.6	1
G				
	<b>SRO ONLY#68</b> 3.7.012G	Generic KA for Reactor Protection System : 2.2.22 Knowledge of limiting conditions for operations and safety	4.1	1
K1				
	RO/SRO#69 3.7.016	Non-Nuclear Instrumentation System		
	3.7.016.K1.10	Knowledge of the physical connections and/or cause-effect relationships between the NNIS and the following systems:	3.1	1
K2				
	RO/SRO#70 3.2.006	Emergency Core Cooling System		
	3.2.006.K2.02	Knowledge of bus power supplies to the following: Valve operators for accumulators	2.9	1
K3				
	RO/SRO#72 3.7.016	Non-Nuclear Instrumentation System		
	3.7.016.K3.08	Knowledge of the effect that a loss or malfunction of the NNIS will have on the following: PZR PCS	3.7	1
	RO/SRO#71 3.4.035	Steam Generator System		
	3.4.035.K3.01	Knowledge of the effect that a loss or malfunction of the S/GS will have on the following: RCS	4.6	1
K4				
	RO/SRO#76 3.8.086	Fire Protection System		
	3.8.086.K4.01	Knowledge of design feature(s) and/or interlock(s) which provide for the following: Adequate supply of water for FPS	3.7	1
	RO/SRO#75 3.7.073	Process Radiation Monitoring System		
	3.7.073.K4.01	Knowledge of PRM system design feature(s) and/or interlocks which provide for the following: Release termination when radiation exceeds setpoint	4.3	1
	RO/SRO#78 3.8.086	Fire Protection System		
	3.8.086.K4.03	Knowledge of design feature(s) and/or interlock(s) which provide for the following: Detection and location of fires	3.7	1
K5				
	RO/SRO#79 3.3.010	Pressurizer Pressure Control System		
	3.3.010.K5.02	Knowledge of the operational implications of the following concepts as they apply to the PZR PCS: Constant enthalpy expansion through a valve	3	1
	RO/SRO#86 3.5.028	Hydrogen Recombiner and Purge Control System		
	3.5.028.K5.02	Knowledge of the operational implications of the following concepts as they apply to the HRPS: Flammable hydrogen concentration	3.9	1
K6				
	RO/SRO#87 3.5.028	Hydrogen Recombiner and Purge Control System		
	3.5.028.K6.01	Knowledge of the effect of a loss or malfunction on the following will have on the HRPS: Hydrogen recombiners	3.1	1
Tier	<b>2</b> Group <b>3</b>			Imp.
	A2			

	RO/SRO#80 3.8.008 3.8.008.A2.04	Component Cooling Water System Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: PRMS alarm	3.5	1
	K1			
	RO/SRO#81 3.4.045 3.4.045.K1.06	Main Turbine Generator System Knowledge of the physical connections and/or cause-effect relationships between the MT/G system and the following systems: RCS, during steam valve test	2.6	1
	K2			
	RO/SRO#83 3.4.076 3.4.076.K2.01	Service Water System Knowledge of bus power supplies to the following: Service	2.7	1
	K4			
	<b>SRO ONLY#84</b> 3.4.045 3.4.045.K4.47	Main Turbine Generator System Knowledge of MT/G system design feature(s) and/or inter-lock(s) which provide for the following: Turbine trip upon reactor trip	4.3	1
Tier	<b>3</b> Group 1			Imp.
	G1			
	<b>SRO ONLY#74</b> 2.1.19 2.1.19	Conduct of Operations: Ability to use plant computer to obtain and evaluate parametric information on system or component STATUS	3	1
	RO/SRO#88 2.1.16 2.1.16	Conduct of Operations: Ability to operate plant phone, paging system, and two-way radio.	2.8	1
	RO/SRO#89 2.1.18 2.1.18	Conduct of Operations: Ability to make accurate, clear and concise logs, records, status boards, and reports.	3	1
	<b>SRO ONLY#77</b> 2.1.22 2.1.22	Conduct of Operations: Ability to determine Mode of	3.3	1
	RO/SRO#90 2.1.24 2.1.24	Conduct of Operations: Ability to obtain and interpret station electrical and mechanical drawings.	3.1	1
	<b>SRO ONLY#82</b> 2.1.6 2.1.6	Conduct of Operations: Ability to supervise and assume a management role during plant transients and upset	4.3	1
Tier	<b>3</b> Group 2			Imp.
	G2			
	<b>SRO ONLY#94</b> 2.2.11 2.2.11	Equipment Control Knowledge of the process for controlling temporary changes.	3.4	1
	<b>SRO ONLY#92</b> 2.2.22 2.2.22	Equipment Control Knowledge of limiting conditions for operations and safety limits.	4.1	1



	<b>SRO ONLY#93</b> 2.2.23				
	2.2.23	Equipment Control Ability to track limiting conditions for operations.	3.8	1	
	RO/SRO#91 2.2.3				
	2.2.3	Equipment Control (multi-unit) Knowledge of the design, procedural, and operational differences between units.	3.3	1	
Tier	<b>3</b> Group 3				Imp.
	G3				
	<b>SRO ONLY#95</b> 2.3.2				
	2.3.2	Radiation Control Knowledge of facility ALARA program.	2.9	1	
	<b>SRO ONLY#96</b> 2.3.4				
	2.3.4	Radiation Control Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	3.1	1	
Tier	<b>3</b> Group 4				Imp.
	G4				
	RO/SRO#99 2.4.47				
	2.4.47	Emergency Procedures / Plan Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.7	1	
	RO/SRO#97 2.4.39				
	2.4.39	Emergency Procedures / Plan Knowledge of the RO's responsibilities in emergency plan implementation.	3.1	1	
	<b>SRO ONLY#85</b> 2.4.43				
	2.4.43	Emergency Procedures / Plan Knowledge of emergency communications systems and techniques.	3.5	1	
	<b>SRO ONLY#100</b> 2.4.25				
	2.4.25	Emergency Procedures / Plan Knowledge of fire protection procedures.	3.4	1	
	<b>SRO ONLY#98</b> 2.4.46				
	2.4.46	Emergency Procedures / Plan Ability to verify that the alarms are consistent with the plant conditions.	3.6	1	

