WOLF CREEK
NUCLEAR OPERATING CORPORATION

To: Howard Bundy (USNRC)

From: Robert Acree (WCNOC)

Date: June 1, 2001

Enclosed is the examination outline for the December 2001 Initial Licensed Operator Test at Wolf Creek Generating Station. The Outline was developed in accordance with NUREG 1021 Revision 8 Supplement 1. The written exam outline was generated using a commercially available product (WOG PWR K/A Database Program Developed by WD Associates, Inc. 515 Main Street PO Box 570 Delta, PA 17314). Rejected K/A's are documented on ES 401-10. Replacement K/A's were systematically and randomly generated in accordance with ES 401 section D.1.e to ensure an overall balance to the examination. The materials enclosed shall be withheld from public disclosure until after the examinations are complete. Included in this submittal are:

- Examination Schedules
- Forms
  - ES 201-2
  - ES 301-1
  - ES 301-2
  - ES D-1
  - ES 401-3
  - ES 401-4
  - ES 401-5
  - ES 401-10
- Draft Copies of the following forms are provided for preliminary review.
  - ES 301-4
  - ES 301-5
  - ES 301-6
- Also included for review is a hard copy of the methodology employed by the written examination outline generator supplied by WD and Associates.

Thank You,

R. Acree

Robert Acree

P.O. Box 411 / Burlington, KS 66839 / Phone: (316) 364-8831

Facility: WGCS Date of Examination: 12/10/2001

Examination Level (circle one): RO / **SRO** Operating Test Number: _____

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	2.1.24 Obtain and Interpret Station Drawings	(CFR 45.12/45.13 SRO 3.1) Provide a recently hung Clearance Order. A report from the field says power is still present. Determine from plant drawings where the error is in the Clearance Order.
	2.1.25 Obtain and Interpret Station Reference Material	(CFR 41.10/43.5/45.12, SRO 3.1) 9 days into a Refueling Outage, Mode 6 with RCS level 3.5 feet below the flange. "A" RHR pump tripped on overcurrent. Attempts to place "B" Train RHR in service have been unsuccessful. Determine the Time to Boiling and Time to Core Un-covery. (Modified from an RO Admin. JPM)
A.2	2.2.8 USQD Determination	(CFR 43.3/45.13, SRO 3.3) Provide Copy of recent Troubleshoot Work Order that installed a jumper to allow engaging the Turning Gear on the Main Turbine so that warm up could proceed. Determine if a USQD is required.
A.3	2.3.2 ALARA	CFR 41.12/43.4/45.9/45.10, SRO 2.9) While in the CCP A room provide a Survey Map and have the applicant determine the best location to minimize their exposure.
A.4	2.4.44 Protective Action Recommendations	(CFR 43.5/45.11, SRO 4.0) Given a description of an Event and the Classification, determine the Protective Action Recommendations (PAR), if any.

Facility: WCGS Date of Examination: 12/10/2001

Examination Level (circle one): **RO** / SRO Operating Test Number: _____

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	2.1.24 Obtain and Interpret Station Drawings	(CFR 45.12/45.13, RO 2.8) Provide a recently hung Clearance Order. A report from the field says power is still present. Determine from plant drawings where the error is in the Clearance Order.
	2.1.20 Execute Procedure Steps	(CFR 41.10/43.5/45.12, RO 4.3) Given the Data and procedure, Calculate QPTR. (Previously used as an SRO Admin. JPM)
A.2	2.2.22 LCO's and Safety Limits	(CFR 43.2/45.2, RO 3.4) Question (Open Reference): Safety Limit Violation. Given a combination of Power, RCS Pressure and Tavg, determine if a Safety Limit has been violated.
	2.2.25 Bases for LCO's and Safety Limits	(CFR 43.2, RO 2.5) Question (Open Reference): T.S. LCO Bases. During Surveillance Testing it is determined that the motor on BG HV-8357A is shorted and the valve will not open. How does this affect the Operability of "A" CCP.
A.3	2.3.2 ALARA Program	(CFR 41.12/43.4/45.9/45.10 RO 2.5) (While in the CCP A room provide a Survey Map and have the applicant determine the best location to minimize their exposure.
A.4	2.4.27. Plant Fire Procedures	(CFR 41.10/43.5/45.13, RO 3.0) Question (Open Reference): Given a fire has occurred in the plant, what are the time limits for when the Off Site Fire Department must be called in to assist.
	2.4.49 Perform Immediate Actions	(CFR 41.10/43.2/45.6, RO 4.0) Question (Closed Reference): A fire has occurred in the Lower Cable Spreading Room leading to spurious actuations and causing evacuation of the Control Room. What are the Immediate Actions of the Reactor Operator.

Facility: WCGS Scenario No.: 1 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: 100% Power, MOL, "D" CCW pump OOS for PM's.

Turnover: Continue plant operations, make preps to return "D" CCW pump to service. System Ops reports Grid Stability problems

Event No.	Malf. No.	Event Type*	Event Description
1	mPCS 02A	I (All)	AB PT-505 (T-Ref) fails low, Rods begin Inserting, BOP verifies no Turbine Runback in progress.
2	mMSS 01D2	I -BOP I-CRS	AB PT-545 fails low, affects Steam Flow Channel AB FT-543. BOP take manual Control of "D" SG FRV.
3	mEPS 03A	R-RO N-BOP N-CRS	La Cygne Line in the switchyard opens, System Ops request reduce load within the hour due to Grid problems. Load reduction commences to less than 968 Mwe per OFN AF-15
4	mMSS 11	C-All	Steam Leak commences in Turbine Building large enough to effect downpower.
5	mMSS 11	M-All	CRS should direct a Reactor Trip, Upon the trip the leak becomes a MSLB. MSIV's will not close.
6		C-RO C-CRS	SI fails to actuate in Automatic. Manual Available. RO/CRS must recognize that an SI will be required or the setpoint has already been reached and SI did not actuate.
7			Uncontrolled de-pressurization of all SG's will require entry into EMG C-21. Scenario terminates after crew establishes 30K Aux Feedwater flow to each SG or at Lead Examiner discretion.

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

Facility: WCGS Scenario No.: 2 Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: The core age is Middle of Life (MOL). The plant has been operating at or near 100% power for the last 42 days. The "B" train Emergency Diesel Generator (EDG) and Centrifugal Charging Pump(CCP) are out of service (OOS) for preventative maintenance. The "D" SG atmospheric relief valve is isolated due to seat leakage.

Turnover: Normal Shift Activities

Event No.	Malf. No.	Event Type*	Event Description
1 T+1		N(SRO) R(RO) N(BOP)	Downpower maneuver to remove the MFP from service.
2 T+4	mCVL-01	C(SRO) C(RO)	VCT divert valve LCV112A-control failure If the operator has begun to borate it will take 6 minutes to reach the low level alarm(first indication). If boration has not commenced an auto makeup will be his first indication within 1-2 minutes.
3 T+15	mNIS-03A	I(SRO) I(RO)	Power Range NI-41 fails high
4 T+20	mFWM-03C	I(SRO) I(BOP)	Steam Generator "C" level controller fails in automatic causing the feed reg. valve to begin closing. Manual is available.
5 T+30	mRCS-06A	M(SRO) M(RO) M(BOP)	RCS loop A 300 gpm leak
6	mPCS-08A&B	C(SRO) C(RO) C(BOP)	The reactor will not trip in manual or automatic. EMG FR-S1 is used to make the reactor subcritical.
7 T+45	P19046 D (8) 1 P19046 C (8) 0	C(SRO) C(RO)	Loss of CCW to the RCPs (Possible Ramp regh71 for booth command)

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

Facility: WCGS Scenario No.: 3 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: 50% Power. "B" Main Feed Pump Tagged out for maintenance on control valve linkage.

Turnover: Continue power reduction to 33% to remove all heater strings. OFN AF-025 is in effect

Event No.	Malf. No.	Event Type*	Event Description
1		R-RO N-BOP N-CRS	Continue Power reduction to 33%.
2	mRCS 01I	I-RO I-CRS	Loop 1 Thot fails high causing a rod insertion.
3	mFWM 02B3	I-BOP I-CRS	"B" SG Level AE LT-529 fails high.
4	mEPS0 1A and 1B	M-All	Sequential Loss of Offsite Power, Reactor Trips due to low RCS flow.
5	mWAT 03A	C-RO C-CRS	"A" ESW pump Trips, "B" ESW pump fails to start. RO/CRS must get "B" ESW pump started prior to the EDG overheating causing entry into EMG C-0.
6	mFWM 12C	C-BOP C-CRS	"D" SG FWIV fails to Auto CLose
7	mMSS 07E	C-BOP C-CRS	"A" SG ARV fails open.

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

Facility: WCGS Scenario No.: 4 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: The plant is at 100% power, EOL. The unit has been at power for the last 417 days. "A" MDAFW pump is out of service for preventive maintenance. "A" CCP out of service for a bearing replacement. PORV BB PCV-455A seat leaks and block valve BB HV-8000A is closed.

Turnover: Refueling outage is scheduled to begin in 14 days. No other maintenance or testing is in progress. Today is Sunday with normal weekend manning.

Event No.	Malf. No.	Event Type*	Event Description
1	mPRS 02	I (SRO) I (RO)	PZR level instrument BB LT-459 fails low
2		N (RO) N(SRO)	Restore normal letdown
3	mFM W04	I (BOP) I (SRO)	Feed water flow transmitter AE FT-510 fails low
4	mRCS 06A	C (ALL)	RCS leak of 50 gpm
5		N (SRO) N(BOP) R (RO)	Plant shutdown due to RCS leak
6	mRCS 06a	M (ALL)	Earthquake(>SSE) causes 10,000gpm LOCA inserted after observable reactivity change
7	mEPS 06B	C (ALL)	Loss of NB02 Vital Bus at trip
8	mECC 02A	C (SRO) C (RO)	SI pump "A" trips after RCPs are tripped..

Scenario will be terminated in EMG FR-C1 after S/G depressurization is established and CETs start to decrease.

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

Facility: WCGS Scenario No.: 5 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: Core age is Middle of Life. Reactor power is 50%.
'B' MFP is tagged out for maintenance on the control valve linkage. NCP OOS for PM's.

Turnover: Increase Power to 60%. Make preps to start "B" MFP. Thunderstorm warning in effect for Coffey county.

Event No.	Malf. No.	Event Type*	Event Description
1		R-RO N-BOP N-CRS	Increase Turbine Load and Reactor Power to 60%.
2	mNIS 03B	I-RO I-CRS	NI-42 Fails high
3	mFWM 02A4	I-BOP I-CRS	"A" SG Level channel AE LI-551 fails low
4	mRCS 02A	M-All	SGTR on "A" SG, Rx Trip and Safety Injection.
5	mCVC 13B	C-RO C-CRS	"B" CCP trips, all RCP seal injection flow lost. Establish seal injection flow from "A" CCP.
6	mMSS 10A	C-BOP C-CRS	During the Cooldown one Steam Dump fails open.

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

Facility: WCGS Scenario No.: 6(Spare) Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: The plant is at MOL. Unit startup is in progress after a 7 day outage to resolve a voltage regulator problem. Reactor power is at E^{-8} Amps, Rod control in manual, Startup feedpump in service, Gen 00-003 is complete through step 6.27.

Turnover: All systems normal, resume startup at step 6.28 of Gen 00-003.

Event No.	Malf. No.	Event Type*	Event Description
1		N (SRO) R (RO)	Increase reactor power to 1%
2	mPRS 01B	I (SRO) I (RO)	Pzr pressure channel BB PT-456 fails high
3	mCVC 13C	C (SRO) C(RO)	The running charging pump (NCP) trips.
4	mPRS 10A	C (SRO) C (RO)	PORV BB PCV-455A excessive seat leakage. Block valve BB HV-8000B is isolated.
5	mMSS 03B	M (SRO) M (RO) M (BOP)	S/G "B" faulted inside containment
6	mPCS 03A	C (SRO) C (RO)	Safeguards sequencer "A" failure
7	mPCS 10A & 10B	C (SRO) C (RO)	Failure of containment isolation phase A

Terminate after stabilization of RCS after Steam Generator blowdown.

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

Facility: WCGS Date of Examination: 12/10/2001
Exam Level (circle one): **RO** / **SRO(I)** Operating Test No.: _____

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. LRW Release Control Room (ASP)	NAS	SF9
b. Increase ECCS Accumulator Pressure	DS	SF3
c. Start H2 Analyzers Post LOCA	DSL	SF5
d. Swap CCW supply to the Service Loop	DSL	SF8
e. Shift Charging Pumps (ASP) (Used on Previous Exam)	DAS	SF2
f. Feed S/G with TDAFWP (ASP) (Used on Previous Exam)	DAS	SF4
g. Perform STS SE-001 (NI Calibraiton)	DC	SF7

B.2 Facility Walk-Through

a. Isolate ESW Drains (OFN SG-003)	N	SF4
b. Swap Vital Instrument Bus to the SOLA Xfmr.	D	SF6
c. Perform Actions for Local Emergency Borate (ASP) (Used on Previous Exam)	DAR	SF1

* 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

Facility: WCGS Date of Examination: 12/10/2001
Exam Level (circle one): **SRO(U)** Operating Test No.: _____

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. LRW Release Control Room (ASP)	NAS	SF9
b.		
c. Start H2 Analyzers Post LOCA	DSL	SF5
d.		
e.		
f.		
g.		

B.2 Facility Walk-Through

a. Isolate ESW Drains (OFN SG-003)	N	SF4
b. Swap Vital Instrument Bus to the SOLA Xfmr.	D	SF6
c. Perform Actions for Local Emergency Borate (ASP) (Used on Previous Exam)	DAR	SF1

* 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

SHEET 1

Facility: WCGS Date of Exam: 12/10/2001 Scenario Numbers: 1 / 3 / 5 Operating Test No.:

QUALITATIVE ATTRIBUTES		Initials a	b*	c#
1.	The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the operators into expected events.			
2.	The scenarios consist mostly of related events.			
3.	Each event description consists of · the point in the scenario when it is to be initiated · the malfunction(s) that are entered to initiate the event · the symptoms/cues that will be visible to the crew · the expected operator actions (by shift position) · the event termination point (if applicable)			
4.	No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.			
5.	The events are valid with regard to physics and thermodynamics.			
6.	Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.			
7.	If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.			
8.	The simulator modeling is not altered.			
9.	The scenarios have been validated. Any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios.			
10.	Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered in accordance with Section D.4 of ES-301.			
11.	All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).			
12.	Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form with the simulator scenarios).			
13.	The level of difficulty is appropriate to support licensing decisions for each crew position.			

TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.4.D)		Actual Attributes	-	--	--
1.	Total malfunctions (5-8)	5 / 5 / 5			
2.	Malfunctions after EOP entry (1-2)	2 / 3 / 3			
3.	Abnormal events (2-4)	2 / 2 /2			
4.	Major transients (1-2)	2 / 1 / 1			
5.	EOPs entered/requiring substantive actions (1-2)	1 / 1 / 1			
6.	EOP contingencies requiring substantive actions (0-2)	1 / 0 / 0			
7.	Critical tasks (2-3)	4 / 3 / 4			

SHEET 2

Facility: WCGS Date of Exam: 12/10/2001 Scenario Numbers: 2 / 4 / 6 Operating Test No.:

QUALITATIVE ATTRIBUTES		Initials a	b*	c#
1.	The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the operators into expected events.			
2.	The scenarios consist mostly of related events.			
3.	Each event description consists of · the point in the scenario when it is to be initiated · the malfunction(s) that are entered to initiate the event · the symptoms/cues that will be visible to the crew · the expected operator actions (by shift position) · the event termination point (if applicable)			
4.	No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.			
5.	The events are valid with regard to physics and thermodynamics.			
6.	Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.			
7.	If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.			
8.	The simulator modeling is not altered.			
9.	The scenarios have been validated. Any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios.			
10.	Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered in accordance with Section D.4 of ES-301.			
11.	All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).			
12.	Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form with the simulator scenarios).			
13.	The level of difficulty is appropriate to support licensing decisions for each crew position.			

TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.4.D)		Actual Attributes	--	--	--
1.	Total malfunctions (5-8)	5 / 5 / 5			
2.	Malfunctions after EOP entry (1-2)	2 / 2 / 2			
3.	Abnormal events (2-4)	3 / 3 / 3			
4.	Major transients (1-2)	1 / 1 / 1			
5.	EOPs entered/requiring substantive actions (1-2)	1 / 1 / 1			
6.	EOP contingencies requiring substantive actions (0-2)	1 / 1 / 1			
7.	Critical tasks (2-3)	4 / 3 / 3			

OPERATING TEST NO.:CREW A

Applicant Type	Evolution Type	Minimum Number	Scenario Number RO1			RO2		
			1	3	5	1	3	5
RO	Reactivity	1	3					1
	Normal	1		1	1	3		
	Instrument / Component	4	1 4 6	3 6 7	3 6	1 4 2		2 5
	Major	1	5	4	4	5		4
SRO-I As RO	Reactivity	1			1			
	Normal	0						
	Instrument / Component	2			2 5			
	Major	1			4			
SRO-I As SRO	Reactivity	0						
	Normal	1				1		
	Instrument / Component	2				2 3 5 6		
	Major	1				4		
SRO-U	Reactivity	0						
	Normal	1	3	1				
	Instrument / Component	2	1 2 4 6	2 3 5 6 7				
	Major	1	5	4				

Scenario				1	3	5
SRO	Position	filled by		U	U	I1
RO	Position	filled by		RO1	I1	RO2
BOP	Position	filled by		RO2	RO1	RO1

Instructions: (1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.

(2) Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

(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 requirement.

Author: _____

NRC Reviewer: _____

OPERATING TEST NO.:CREW B

Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1	3	5	N/A
RO	Reactivity	1			1	
	Normal	1	3	1		
	Instrument / Component	4	1 2 4	3 6 7	2 3 5 6	
	Major	1	5	4	4	
As RO	Reactivity	1	3	1		
	Normal	0			1	
	Instrument / Component	2	1 6 4	2 5	3 6	
	Major	1	5	4	4	
SRO-I						
As SRO	Reactivity	0				
	Normal	1	3	1	1	
	Instrument / Component	2	1 2 4 6	2 3 5 6 7	2 3 5 6	
	Major	1	5	4	4	
SRO-U	Reactivity	0				
	Normal	1				
	Instrument / Component	2				
	Major	1				

SRO	Position	filled by		SO2	SO3	SO2
RO	Position	filled by		SO3	SO2	RO3
BOP	Position	filled by		RO3	RO3	SO3

Instructions:
(1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.
(2) Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.
(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 requirement.

Author: _____

NRC Reviewer: _____

OPERATING TEST NO.:CREW C

Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1	3	4	N/A
RO	Reactivity	1			5	
	Normal	1	3	1	2	
	Instrument / Component	4	1 2 4	3 6 7	1 4 8 7	
	Major	1	5	4	6	
As RO	Reactivity	1	3	1		
	Normal	0			5	
	Instrument / Component	2	1 6 4	2 5	3 4 7	
	Major	1	5	4	6	
SRO-I						
As SRO	Reactivity	0				
	Normal	1	3	1	2 5	
	Instrument / Component	2	1 2 4 6	2 3 5 6 7	1 3 4 7 8	
	Major	1	5	4	6	
SRO-U	Reactivity	0				
	Normal	1				
	Instrument / Component	2				
	Major	1				

SRO	Position	filled by		SO4	SO5	SO4
RO	Position	filled by		SO5	SO4	RO4
BOP	Position	filled by		RO4	RO4	SO5

Instructions:
(1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.
(2) Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.
(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 requirement.

Author: _____

NRC Reviewer: _____

OPERATING TEST NO.:CREW D

Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1	2	3	N/A
RO	Reactivity	1		1		
	Normal	1	3		1	
	Instrument / Component	4	1 2 4	2 3 6 7	3 6 7	
	Major	1	5	5	4	
As RO	Reactivity	1	3		1	
	Normal	0		1		
	Instrument / Component	2	1 6 4	4 6	2 5	
	Major	1	5	5	4	
SRO-I						
As SRO	Reactivity	0				
	Normal	1	3	1	1	
	Instrument / Component	2	1 2 4 6	2 3 4 6 7	2 3 5 6 7	
	Major	1	5	5	4	
SRO-U	Reactivity	0				
	Normal	1				
	Instrument / Component	2				
	Major	1				

SRO	Position	filled by		SO6	SO6	SO7
RO	Position	filled by		SO7	RO5	SO6
BOP	Position	filled by		RO5	SO7	RO5

Instructions: (1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.

(2) Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

(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 requirement.

Author: _____

NRC Reviewer: _____

CREW A (Sheet 1)

Competencies	Applicant #1 SRO-U				Applicant #2 RO1				Applicant #3 RO2			
	SCENARIO				SCENARIO				SCENARIO			
	1	3	5		1	3	5		1	3	5	
Understand and Interpret Annunciators and Alarms	2	2 4 5				3 4	2 3		2		2 5	
Diagnose Events and Conditions	1 4	7			1 4	2	4		1 4		4	
Understand Plant and System Response	1 4	5 7			4	7	4 6		1 4		1 2 4	
Comply With and Use Procedures (1)	3 5 7	1 2 3			4 5 6	3	1 3 4		2 4 5		1 2 4 5	
Operate Control Boards (2)					1 3 5 6	3	1 3		2		1 2 5	
Communicate and Interact With the Crew	ALL	ALL			1 3 4 5 6	1 2 3 6 7	1 3 4 5 6		1 2 4		1 2 4 5	
Demonstrate Supervisory Ability (3)	3 5 7	1 2 3 5 6 7										
Comply With and Use Tech. Specs. (3)	2	2 3										

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:
Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: _____

NRC Reviewer: _____

CREW A (Sheet 2)

Competencies	Applicant #4 SRO-I1 SCENARIO 1	3	5	
Understand and Interpret Annunciators and Alarms		2 4	2 3 5	
Diagnose Events and Conditions		2 5	4 5 6	
Understand Plant and System Response		2 4	1 4 5	
Comply With and Use Procedures (1)		1 2	1 2 3 4 6	
Operate Control Boards (2)		1 2 5		
Communicate and Interact With the Crew		1 2 4 5	ALL	
Demonstrate Supervisory Ability (3)			1 2 3	
Comply With and Use Tech. Specs. (3)			2 3	

Notes:

(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:
Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: _____

NRC Reviewer: _____

CREW B

Competencies	Applicant #1 SRO-I2				Applicant #2 SRO-I3				Applicant #3 RO-3			
	SCENARIO				SCENARIO				SCENARIO			
	1	3	5		1	3	5		1	3	5	
Understand and Interpret Annunciators and Alarms	2	2 4	2 3 5			2 4 5	2 3		2	3 4	2 5	
Diagnose Events and Conditions	1 4	2 5	4 5 6		1 4	7	4		1 4	2	4	
Understand Plant and System Response	1 4	2 4	1 4 5		4	5 7	4 6		1 4	7	1 2 4	
Comply With and Use Procedures (1)	3 5 7	1 2	1 2 3 4 5		4 5 6	1 2 3	1 3 4		2 4 5	3	1 2 4 5	
Operate Control Boards (2)		1 2 5			1 3 5 6		1 3 5		2	3	1 2 5	
Communicate and Interact With the Crew	All	1 2 4 5	All		1 3 4 5 6	All	1 3 4 6		1 2 4	1 2 3 6 7	1 2 4 5	
Demonstrate Supervisory Ability (3)	3 5 7		1 2 3			1 2 3 5 6 7						
Comply With and Use Tech. Specs. (3)	2		2 3			2 3						

Notes:
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(2) Optional for an SRO-U.
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Instructions:
Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: _____

NRC Reviewer: _____

CREW C

Competencies	Applicant #1 SRO-I4				Applicant #2 SRO-I5				Applicant #3 RO4			
	SCENARIO				SCENARIO				SCENARIO			
	1	3	4		1	3	4		1	3	4	
Understand and Interpret Annunciators and Alarms	2	2 4	1 3 7		1 4	2 4 5	3 7		2	3 4	1 2	
Diagnose Events and Conditions	1 4	2 5	5 8		1 4	7	4 6		1 4	2	2 4 6	
Understand Plant and System Response	1 4	2 4	2 4		4	5 7	5		1 4	7	2 4	
Comply With and Use Procedures (1)	3 5 7	1 2	1 2 3 5 6		4 5 6	1 2 3	3 5 6		2 4 5	3	1 2 5 6 7	
Operate Control Boards (2)		1 2 5			1 3 5 6		3 5		2	3	1 2 5	
Communicate and Interact With the Crew	All	1 2 4 5	All		1 3 4 5 6	All	3 4 6 7		1 2 4	1 2 3 6 7	1 2 4 5 7 8	
Demonstrate Supervisory Ability (3)	3 5 7		1 2 3 4 5 7 8			1 2 3 5 6 7						
Comply With and Use Tech. Specs. (3)	2		1 3 4			2 3						

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:
Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: _____

NRC Reviewer: _____

CREW D

Competencies	Applicant #1 SRO-I6				Applicant #2 SRO-I7				Applicant #3 RO5			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3		1	2	3		1	2	3	
Understand and Interpret Annunciators and Alarms	2	3 4	2 4			4	2 4 5		2	3 7	2 3	
Diagnose Events and Conditions	1 4	2 7	2 5		1 4	5 6	7		1 4	4 6	4	
Understand Plant and System Response	1 4	2 7	2 4		4	5	5 7		1 4	2 5	4 7	
Comply With and Use Procedures (1)	3 5 7	1 2 3	1 2		4 5 6	1 6	1 2 3		2 4 5	1 3 5 6	1 3 4	
Operate Control Boards (2)			1 2 5		1 3 5 6	4			2	1 2 3 6 7	1 3 5	
Communicate and Interact With the Crew	All	All	1 2 4 5		1 3 4 5 6	3 4 5 6	All		1 2 4	1 2 3 5 6 7	1 3 4 5 7	
Demonstrate Supervisory Ability (3)	3 5 7	1 2 3 4 6 7					1 2 3 5 6 7					
Comply With and Use Tech. Specs. (3)	2	3					2 3					

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:
Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: _____

NRC Reviewer: _____

Facility: WCGS Form ES-401-3

Exam Date: 12/07/2001 **Exam Level:** SRO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	4	4	3				5	6			2	24
	2	3	3	3				2	3			2	16
	3	1	1	0				0	0			1	3
	Tier Totals	8	8	6				7	9			5	43
2. Plant Systems	1	2	2	2	2	1	2	2	2	1	2	1	19
	2	1	1	2	2	2	1	2	1	2	1	2	17
	3	0	0	1	0	1	0	0	1	1	0	0	4
	Tier Totals	3	3	5	4	4	3	4	4	4	3	3	40
3. Generic Knowledge And Abilities		Cat 1			Cat 2			Cat 3			Cat 4		
		4			4			4			5		17

Note:
1. Ensure that at least two topics from every K/A category are sampled within each teir (i.e., the "Tier Totals" in each K/A category shall not be less than two).
2. Actual point totals must match those specified in the table.
3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6. The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorites. Enter the tier totals for each category in the table above.

Facility: WCGS

PWR SRO Examination Outline

Printed: 06/01/2001

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-3**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
001	Continuous Rod Withdrawal / 1		X					AK2.08 - Individual rod display lights and indications	3.0	1
003	Dropped Control Rod / 1	X						AK1.10 - Definitions of core quadrant power tilt	2.9	1
005	Inoperable/Stuck Control Rod / 1	X						AK1.04 - Definitions of axial imbalance, neutron error, power demand, actual power tracking mode, ICS tracking	3.4*	1
005	Inoperable/Stuck Control Rod / 1		X					AK2.02 - Breakers, relays, disconnects, and control room switches	2.6	1
011	Large Break LOCA / 3					X		EA2.06 - That fan is in slow speed and dampers are in accident mode during LOCA	4.0*	1
015	Reactor Coolant Pump (RCP) Malfunctions / 4		X					AK2.10 - RCP indicators and controls	2.8	1
017	Reactor Coolant Pump (RCP) Malfunctions (Loss of RC Flow) / 4				X			AA1.03 - Reactor trip alarms, switches, and indicators	3.8	1
026	Loss of Component Cooling Water (CCW) / 8						X	2.2.21 - Knowledge of pre- and post-maintenance operability requirements.	3.5	1
029	Anticipated Transient Without Scram (ATWS) / 1	X						EK1.02 - Definition of reactivity	2.8	1
040	Steam Line Rupture / 4			X				AK3.03 - Steam line non-return valves	3.5*	1

Facility: WCGS

PWR SRO Examination Outline

Printed: 06/01/2001

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-3**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
055	Loss of Offsite and Onsite Power (Station Blackout) / 6					X		EA2.03 - Actions necessary to restore power	4.7	1
057	Loss of Vital AC Electrical Instrument Bus / 6				X			AA1.04 - RWST and VCT valves	3.6	1
057	Loss of Vital AC Electrical Instrument Bus / 6					X		AA2.05 - S/G pressure and level meters	3.8	1
068	Control Room Evacuation / 8		X					AK2.07 - ED/G	3.4	1
069	Loss of Containment Integrity / 5					X		AA2.02 - Verification of automatic and manual means of restoring integrity	4.4	1
069	Loss of Containment Integrity / 5				X			AA1.03 - Fluid systems penetrating containment	3.0	1
E02	SI Termination / 3				X			EA1.2 - Operating behavior characteristics of the facility	3.8	1
E04	LOCA Outside Containment / 3					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.3	1
E06	Degraded Core Cooling / 4					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.2	1

Facility: WCGS

PWR SRO Examination Outline

Printed: 06/01/2001

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-3**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
E07	Saturated Core Cooling / 4			X				EK3.1 - 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
E08	Pressurized Thermal Shock / 4	X						EK1.1 - Components, capacity, and function of emergency systems	3.8	1
E09	Natural Circulation Operations / 4			X				EK3.1 - 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	3.6	1
E10	Natural Circulation with Steam Void in Vessel with/without RVLIS / 4				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.6	1
E14	High Containment Pressure / 5						X	2.4.10 - Knowledge of annunciator response procedures.	3.1	1

K/A Category Totals: **4** **4** **3** **5** **6** **2** **Group Point Total:** **24**

Facility: WCGS

PWR SRO Examination Outline

Printed: 06/01/2001

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-3**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
007	Reactor Trip / 1					X		EA2.03 - Reactor trip breaker position	4.4	1
008	Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open) / 3	X						AK1.02 - Change in leak rate with change in pressure	3.7	1
008	Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open) / 3		X					AK2.02 - Sensors and detectors	2.7	1
009	Small Break LOCA / 3					X		EA2.10 - Airborne activity	3.7	1
022	Loss of Reactor Coolant Makeup / 2				X			AA1.02 - CVCS charging low flow alarm, sensor, and indicator	2.9	1
025	Loss of Residual Heat Removal System (RHRS) / 4		X					AK2.03 - Service water or closed cooling water pumps	2.7	1
027	Pressurizer Pressure Control (PZR PCS) Malfunction / 3	X						AK1.01 - Definition of saturation temperature	3.4	1
033	Loss of Intermediate Range Nuclear Instrumentation / 7			X				AK3.02 - Guidance contained in EOP for loss of intermediate-range instrumentation	3.9	1
037	Steam Generator (S/G) Tube Leak / 3				X			AA1.06 - Main steam line rad monitor meters	3.9*	1

Facility: WCGS

PWR SRO Examination Outline

Printed: 06/01/2001

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-3**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
054	Loss of Main Feedwater (MFW) / 4	X						AK1.02 - Effects of feedwater introduction on dry S/G	4.2	1
054	Loss of Main Feedwater (MFW) / 4			X				AK3.01 - Reactor and/or turbine trip, manual and automatic	4.4	1
058	Loss of DC Power / 6						X	2.2.25 - Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
060	Accidental Gaseous Radwaste Release / 9					X		AA2.04 - The effects on the power plant of isolating a given radioactive-gas leak	3.4*	1
E03	LOCA Cooldown and Depressurization / 4						X	2.4.21 - Knowledge of the parameters and logic used to assess the status of safety functions including: 1. Reactivity control; 2. Core cooling and heat removal; 3. Reactor coolant system integrity; 4. Containment conditions; 5. Radioactivity release control.	4.3	1
E05	Loss of Secondary Heat Sink / 4		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.9	1
E11	Loss of Emergency Coolant Recirculation / 4			X				EK3.1 - 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	3.9	1

K/A Category Totals: **3** **3** **3** **2** **3** **2** **Group Point Total:** **16**

Facility: WCGS

PWR SRO Examination Outline

Printed: 06/01/2001

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 3** **Form ES-401-3**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
028	Pressurizer (PZR) Level Control Malfunction / 2		X					AK2.03 - Controllers and positioners	2.9	1
056	Loss of Offsite Power / 6	X						AK1.01 - Principle of cooling by natural convection	4.2	1
E13	Steam Generator Overpressure / 4						X	2.4.6 - Knowledge symptom based EOP mitigation strategies.	4.0	1

K/A Category Totals: **1 1 0 0 0 1** **Group Point Total:** **3**

PWR SRO Examination Outline

Printed: 06/01/2001

Facility: WCGS

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-3**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
003	Reactor Coolant Pump System (RCPS) / 4		X										K2.02 - CCW pumps	2.6*	1
003	Reactor Coolant Pump System (RCPS) / 4					X							K5.03 - Effects of RCP shutdown on T-ave., including the reason for the unreliability of T-ave. in the shutdown loop	3.5	1
004	Chemical and Volume Control System (CVCS) / 1				X								K4.15 - Interlocks associated with operation of orifice isolation valves	3.4	1
013	Engineered Safety Features Actuation System (ESFAS) / 2	X											K1.03 - CCS	4.1	1
015	Nuclear Instrumentation System / 7						X						K6.03 - Component interconnections	3.0	1
017	In-Core Temperature Monitor (ITM) System / 7			X									K3.01 - Natural circulation indications	3.7*	1
022	Containment Cooling System (CCS) / 5							X					A1.03 - Containment humidity	3.4	1
026	Containment Spray System (CSS) / 5											X	2.1.34 - Ability to maintain primary and secondary plant chemistry within allowable limits.	2.9	1
026	Containment Spray System (CSS) / 5			X									K3.02 - Recirculation spray system	4.3	1
056	Condensate System / 4								X				A2.04 - Loss of condensate pumps	2.8*	1

PWR SRO Examination Outline

Printed: 06/01/2001

Facility: WCGS

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-3**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
059	Main Feedwater (MFW) System / 4				X								K4.16 - Automatic trips for MFW pumps	3.2*	1
061	Auxiliary / Emergency Feedwater (AFW) System / 4		X										K2.02 - AFW electric driven pumps	3.7	1
063	D.C. Electrical Distribution System / 6									X			A3.01 - Meters, annunciators, dials, recorders, and indicating lights	3.1	1
063	D.C. Electrical Distribution System / 6										X		A4.03 - Battery discharge rate	3.1	1
068	Liquid Radwaste System (LRS) / 9	X											K1.07 - Sources of liquid wastes for LRS	2.9	1
068	Liquid Radwaste System (LRS) / 9						X						K6.10 - Radiation monitors	2.9	1
071	Waste Gas Disposal System (WGDS) / 9								X				A2.09 - Stuck-open relief valve	3.5*	1
072	Area Radiation Monitoring (ARM) System / 7							X					A1.01 - Radiation levels	3.6	1
072	Area Radiation Monitoring (ARM) System / 7										X		A4.02 - Major components	2.5	1

K/A Category Totals: 2 2 2 2 1 2 2 2 1 2 1 **Group Point Total:** 19

PWR SRO Examination Outline

Printed: 06/01/2001

Facility: WCGS

ES - 401 **Plant Systems - Tier 2 / Group 2** **Form ES-401-3**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
002	Reactor Coolant System (RCS) / 2											X	2.4.10 - Knowledge of annunciator response procedures.	3.1	1
002	Reactor Coolant System (RCS) / 2			X									K3.02 - Fuel	4.5	1
006	Emergency Core Cooling System (ECCS) / 2					X							K5.10 - Theory of thermal stress	2.9*	1
006	Emergency Core Cooling System (ECCS) / 2							X					A1.09 - Pump amperage, including start, normal and locked	3.2	1
010	Pressurizer Pressure Control System (PZR PCS) / 3				X								K4.01 - Spray valve warm-up	2.9	1
012	Reactor Protection System / 7		X										K2.01 - RPS channels, components, and interconnections	3.7	1
012	Reactor Protection System / 7									X			A3.02 - Bistables	3.6	1
028	Hydrogen Recombiner and Purge Control System (HRPS) / 5						X						K6.01 - Hydrogen recombiners	3.1	1
029	Containment Purge System (CPS) / 8				X								K4.03 - Automatic purge isolation	3.5	1
035	Steam Generator System (S/GS) / 4										X		A4.06 - S/G isolation on steam leak or tube rupture/leak	4.6	1
039	Main and Reheat Steam System (MRSS) / 4			X									K3.04 - MFW pumps	2.6*	1

Facility: WCGS

PWR SRO Examination Outline

Printed: 06/01/2001

ES - 401 **Plant Systems - Tier 2 / Group 2** **Form ES-401-3**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
055	Condenser Air Removal System (CARS) / 4	X											K1.06 - PRM system	2.6	1
064	Emergency Diesel Generator (ED/G) System / 6							X					A1.01 - ED/G lube oil temperature and pressure	3.1	1
073	Process Radiation Monitoring (PRM) System / 7											X	2.4.4 - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	1
079	Station Air System (SAS) / 8								X				A2.01 - Cross-connection with IAS	3.2	1
086	Fire Protection System (FPS) / 8					X							K5.03 - Effect of water spray on electrical components	3.4	1
086	Fire Protection System (FPS) / 8									X			A3.03 - Actuation of fire detectors	3.3	1

K/A Category Totals: 1 1 2 2 2 1 2 1 2 1 2 **Group Point Total:** 17

PWR SRO Examination Outline

Printed: 06/01/2001

Facility: WCGS

ES - 401 **Plant Systems - Tier 2 / Group 3** **Form ES-401-3**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
007	Pressurizer Relief Tank/Quench Tank System (PRTS) / 5			X									K3.01 - Containment	3.6	1
008	Component Cooling Water System (CCWS) / 8									X			A3.08 - Automatic actions associated with the CCWS that occur as a result of a safety injection signal	3.7*	1
041	Steam Dump System (SDS) and Turbine Bypass Control / 4								X				A2.03 - Loss of IAS	3.1	1
045	Main Turbine Generator (MT/G) System / 4					X							K5.23 - Relationship between rod control and RCS boron concentration during T/G load increases	2.8	1
K/A Category Totals:		**0**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**		**Group Point Total:**	**4**

Generic Knowledge and Abilities Outline (Tier 3)

Printed: 06/01/2001

PWR SRO Examination Outline

Form ES-401-5

Facility: WCGS

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.11	Knowledge of less than one hour technical specification action statements for systems.	3.8	1
	2.1.20	Ability to execute procedure steps.	4.2	1
	2.1.22	Ability to determine Mode of Operation.	3.3	1
	2.1.30	Ability to locate and operate components, including local controls.	3.4	1
			Category Total:	**4**
Equipment Control	2.2.13	Knowledge of tagging and clearance procedures.	3.8	1
	2.2.19	Knowledge of maintenance work order requirements.	3.1	1
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
	2.2.33	Knowledge of control rod programming.	2.9	1
			Category Total:	**4**
Radiation Control	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	3.0	1
	2.3.2	Knowledge of facility ALARA program.	2.9	1
	2.3.3	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g., waste disposal and handling systems).	2.9	1
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	3.3	1
			Category Total:	**4**

Generic Knowledge and Abilities Outline (Tier 3)

Printed: 06/01/2001

PWR SRO Examination Outline

Form ES-401-5

Facility: WCGS

Generic Category	KA	KA Topic	Imp.	Points
Emergency Procedures/Plan	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. Note: The issue of setpoints and automatic safety features is not specifically covered in the systems sections.	4.1	1
	2.4.10	Knowledge of annunciator response procedures.	3.1	1
	2.4.11	Knowledge of abnormal condition procedures.	3.6	1
	2.4.16	Knowledge of EOP implementation hierarchy and coordination with other support procedures.	4.0	1
	2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.	3.8	1

Category Total: 5

Generic Total: 17

Facility: WCGS Form ES-401-4

Exam Date: 12/07/2001 **Exam Level:** RO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	3	3	3				4	2			1	16
	2	4	4	3				3	2			1	17
	3	1	1	0				0	1			0	3
	Totals Tier	8	8	6				7	5			2	36
2. Plant Systems	1	2	2	0	2	3	2	2	3	3	2	2	23
	2	1	2	3	2	2	1	2	1	3	2	1	20
	3	1	0	1	1	1	1	0	1	1	1	0	8
	Tier Totals	4	4	4	5	6	4	4	5	7	5	3	51
3. Generic Knowledge And Abilities		Cat 1			Cat 2			Cat 3			Cat 4		
		3			3			4			3		13

Note:
1. Ensure that at least two topics from every K/A category are sampled within each teir (i.e., the "Tier Totals" in each K/A category shall not be less than two).
2. Actual point totals must match those specified in the table.
3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category /tier.
6. The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorites. Enter the tier totals for each category in the table above.

Facility: WCGS

PWR RO Examination Outline

Printed: 06/01/2001

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-4**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
005	Inoperable/Stuck Control Rod / 1	X						AK1.04 - Definitions of axial imbalance, neutron error, power demand, actual power tracking mode, ICS tracking	3.0*	1
005	Inoperable/Stuck Control Rod / 1		X					AK2.02 - Breakers, relays, disconnects, and control room switches	2.5	1
015	Reactor Coolant Pump (RCP) Malfunctions / 4		X					AK2.10 - RCP indicators and controls	2.8*	1
017	Reactor Coolant Pump (RCP) Malfunctions (Loss of RC Flow) / 4				X			AA1.03 - Reactor trip alarms, switches, and indicators	3.7*	1
027	Pressurizer Pressure Control (PZR PCS) Malfunction / 3	X						AK1.01 - Definition of saturation temperature	3.1	1
040	Steam Line Rupture / 4			X				AK3.03 - Steam line non-return valves	3.2*	1
057	Loss of Vital AC Electrical Instrument Bus / 6				X			AA1.04 - RWST and VCT valves	3.5	1
068	Control Room Evacuation / 8		X					AK2.07 - ED/G	3.3	1
069	Loss of Containment Integrity / 5				X			AA1.03 - Fluid systems penetrating containment	2.8	1

Facility: WCGS

PWR RO Examination Outline

Printed: 06/01/2001

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-4**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
074	Inadequate Core Cooling / 4					X		EA2.08 - The effect of turbine bypass valve operation on RCS temperature and pressure	3.8	1
074	Inadequate Core Cooling / 4						X	2.4.21 - Knowledge of the parameters and logic used to assess the status of safety functions including: 1. Reactivity control; 2. Core cooling and heat removal; 3. Reactor coolant system integrity; 4. Containment conditions; 5. Radioactivity release control.	3.7	1
076	High Reactor Coolant Activity / 9					X		AA2.01 - Location or process point that is causing an alarm	2.7	1
E07	Saturated Core Cooling / 4			X				EK3.1 - 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
E08	Pressurized Thermal Shock / 4	X						EK1.1 - Components, capacity, and function of emergency systems	3.5	1
E09	Natural Circulation Operations / 4			X				EK3.1 - 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	3.3	1
E10	Natural Circulation with Steam Void in Vessel with/without RVLIS / 4				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.8	1

K/A Category Totals: 3 3 3 4 2 1 **Group Point Total:** 16

Facility: WCGS

PWR RO Examination Outline

Printed: 06/01/2001

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-4**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
001	Continuous Rod Withdrawal / 1		X					AK2.08 - Individual rod display lights and indications	3.1	1
001	Continuous Rod Withdrawal / 1					X		AA2.02 - Position of emergency boration valve	4.2	1
003	Dropped Control Rod / 1	X						AK1.10 - Definitions of core quadrant power tilt	2.6	1
008	Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open) / 3	X						AK1.02 - Change in leak rate with change in pressure	3.1	1
008	Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open) / 3		X					AK2.02 - Sensors and detectors	2.7*	1
009	Small Break LOCA / 3					X		EA2.10 - Airborne activity	3.1	1
022	Loss of Reactor Coolant Makeup / 2				X			AA1.02 - CVCS charging low flow alarm, sensor, and indicator	3.0	1
025	Loss of Residual Heat Removal System (RHRS) / 4		X					AK2.03 - Service water or closed cooling water pumps	2.7	1
029	Anticipated Transient Without Scram (ATWS) / 1	X						EK1.02 - Definition of reactivity	2.6	1
033	Loss of Intermediate Range Nuclear Instrumentation / 7			X				AK3.02 - Guidance contained in EOP for loss of intermediate-range instrumentation	3.6	1

Facility: WCGS

PWR RO Examination Outline

Printed: 06/01/2001

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-4**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
037	Steam Generator (S/G) Tube Leak / 3				X			AA1.06 - Main steam line rad monitor meters	3.8*	1
054	Loss of Main Feedwater (MFW) / 4	X						AK1.02 - Effects of feedwater introduction on dry S/G	3.6	1
054	Loss of Main Feedwater (MFW) / 4			X				AK3.01 - Reactor and/or turbine trip, manual and automatic	4.1	1
058	Loss of DC Power / 6						X	2.2.25 - Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	2.5	1
E02	SI Termination / 3				X			EA1.2 - Operating behavior characteristics of the facility	3.6	1
E05	Loss of Secondary Heat Sink / 4		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.7	1
E11	Loss of Emergency Coolant Recirculation / 4			X				EK3.1 - 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	3.3	1

K/A Category Totals: **4** **4** **3** **3** **2** **1** **Group Point Total:** **17**

Facility: WCGS

PWR RO Examination Outline

Printed: 06/01/2001

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 3** **Form ES-401-4**

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
028	Pressurizer (PZR) Level Control Malfunction / 2		X					AK2.03 - Controllers and positioners	2.6	1
056	Loss of Offsite Power / 6	X						AK1.01 - Principle of cooling by natural convection	3.7	1
065	Loss of Instrument Air / 8					X		AA2.07 - Whether backup nitrogen supply is controlling valve position	2.8*	1

K/A Category Totals: **1** **1** **0** **0** **1** **0** **Group Point Total:** **3**

PWR RO Examination Outline

Printed: 06/01/2001

Facility: WCGS

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-4**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
001	Control Rod Drive System / 1									X			A3.06 - RCS temperature and pressure	3.9	1
003	Reactor Coolant Pump System (RCPS) / 4		X										K2.02 - CCW pumps	2.5*	1
003	Reactor Coolant Pump System (RCPS) / 4					X							K5.03 - Effects of RCP shutdown on T-ave., including the reason for the unreliability of T-ave. in the shutdown loop	3.1	1
004	Chemical and Volume Control System (CVCS) / 1				X								K4.15 - Interlocks associated with operation of orifice isolation valves	3.0*	1
004	Chemical and Volume Control System (CVCS) / 1										X		A4.09 - PZR spray and heater controls	3.5	1
013	Engineered Safety Features Actuation System (ESFAS) / 2								X				A2.01 - LOCA	4.6	1
013	Engineered Safety Features Actuation System (ESFAS) / 2	X											K1.03 - CCS	3.8	1
015	Nuclear Instrumentation System / 7						X						K6.03 - Component interconnections	2.6	1
015	Nuclear Instrumentation System / 7											X	2.2.23 - Ability to track limiting conditions for operations.	2.6	1
017	In-Core Temperature Monitor (ITM) System / 7					X							K5.01 - Temperature at which cladding and fuel melt	3.1	1
017	In-Core Temperature Monitor (ITM) System / 7									X			A3.01 - Indications of normal, natural, and interrupted circulation of RCS	3.6*	1

Facility: WCGS

PWR RO Examination Outline

Printed: 06/01/2001

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-4**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
022	Containment Cooling System (CCS) / 5							X					A1.03 - Containment humidity	3.1	1
056	Condensate System / 4								X				A2.04 - Loss of condensate pumps	2.6	1
059	Main Feedwater (MFW) System / 4				X								K4.16 - Automatic trips for MFW pumps	3.1*	1
059	Main Feedwater (MFW) System / 4									X			A3.02 - Programmed levels of the S/G	2.9	1
061	Auxiliary / Emergency Feedwater (AFW) System / 4					X							K5.03 - Pump head effects when control valve is shut	2.6	1
061	Auxiliary / Emergency Feedwater (AFW) System / 4		X										K2.02 - AFW electric driven pumps	3.7*	1
068	Liquid Radwaste System (LRS) / 9	X											K1.07 - Sources of liquid wastes for LRS	2.7	1
068	Liquid Radwaste System (LRS) / 9						X						K6.10 - Radiation monitors	2.5	1
071	Waste Gas Disposal System (WGDS) / 9								X				A2.09 - Stuck-open relief valve	3.0*	1
071	Waste Gas Disposal System (WGDS) / 9											X	2.1.27 - Knowledge of system purpose and or function.	2.8	1
072	Area Radiation Monitoring (ARM) System / 7							X					A1.01 - Radiation levels	3.4	1

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PWR RO Examination Outline

Printed: 06/01/2001

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-4**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
072	Area Radiation Monitoring (ARM) System / 7										X		A4.02 - Major components	2.5*	1

K/A Category Totals: 2 2 0 2 3 2 2 3 3 2 2 **Group Point Total:** 23

PWR RO Examination Outline

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ES - 401 **Plant Systems - Tier 2 / Group 2** **Form ES-401-4**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
002	Reactor Coolant System (RCS) / 2			X									K3.02 - Fuel	4.2	1
006	Emergency Core Cooling System (ECCS) / 2					X							K5.10 - Theory of thermal stress	2.5	1
006	Emergency Core Cooling System (ECCS) / 2							X					A1.09 - Pump amperage, including start, normal and locked	2.8	1
010	Pressurizer Pressure Control System (PZR PCS) / 3				X								K4.01 - Spray valve warm-up	2.7	1
012	Reactor Protection System / 7		X										K2.01 - RPS channels, components, and interconnections	3.3	1
012	Reactor Protection System / 7									X			A3.02 - Bistables	3.6	1
026	Containment Spray System (CSS) / 5			X									K3.02 - Recirculation spray system	4.2*	1
026	Containment Spray System (CSS) / 5											X	2.1.2 - Knowledge of operator responsibilities during all modes of plant operation.	3.0	1
029	Containment Purge System (CPS) / 8				X								K4.03 - Automatic purge isolation	3.2*	1
035	Steam Generator System (S/GS) / 4										X		A4.06 - S/G isolation on steam leak or tube rupture/leak	4.5	1
035	Steam Generator System (S/GS) / 4						X						K6.02 - Secondary PORV	3.1	1

PWR RO Examination Outline

Printed: 06/01/2001

Facility: WCGS

ES - 401 **Plant Systems - Tier 2 / Group 2** **Form ES-401-4**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
039	Main and Reheat Steam System (MRSS) / 4			X									K3.04 - MFW pumps	2.5*	1
055	Condenser Air Removal System (CARS) / 4	X											K1.06 - PRM system	2.6	1
062	A.C. Electrical Distribution System / 6		X										K2.01 - Major system loads	3.3	1
063	D.C. Electrical Distribution System / 6									X			A3.01 - Meters, annunciators, dials, recorders, and indicating lights	2.7	1
063	D.C. Electrical Distribution System / 6										X		A4.03 - Battery discharge rate	3.0*	1
064	Emergency Diesel Generator (ED/G) System / 6							X					A1.01 - ED/G lube oil temperature and pressure	3.0	1
079	Station Air System (SAS) / 8								X				A2.01 - Cross-connection with IAS	2.9	1
086	Fire Protection System (FPS) / 8					X							K5.03 - Effect of water spray on electrical components	3.1	1
086	Fire Protection System (FPS) / 8									X			A3.03 - Actuation of fire detectors	2.9	1

K/A Category Totals: 1 2 3 2 2 1 2 1 3 2 1 **Group Point Total:** 20

Facility: WCGS

PWR RO Examination Outline

Printed: 06/01/2001

ES - 401 **Plant Systems - Tier 2 / Group 3** **Form ES-401-4**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
007	Pressurizer Relief Tank/Quench Tank System (PRTS) / 5			X									K3.01 - Containment	3.3	1
008	Component Cooling Water System (CCWS) / 8									X			A3.08 - Automatic actions associated with the CCWS that occur as a result of a safety injection signal	3.6*	1
028	Hydrogen Recombiner and Purge Control System (HRPS) / 5						X						K6.01 - Hydrogen recombiners	2.6	1
034	Fuel Handling Equipment System (FHES) / 8										X		A4.01 - Radiation levels	3.3	1
041	Steam Dump System (SDS) and Turbine Bypass Control / 4								X				A2.03 - Loss of IAS	2.8	1
045	Main Turbine Generator (MT/G) System / 4					X							K5.23 - Relationship between rod control and RCS boron concentration during T/G load increases	2.7	1
076	Service Water System (SWS) / 4				X								K4.01 - Conditions initiating automatic closure of closed cooling water auxiliary building header supply and return valves	2.5*	1
103	Containment System / 5	X											K1.02 - Containment isolation/containment integrity	3.9	1

K/A Category Totals: **1 0 1 1 1 1 0 1 1 1 0** **Group Point Total:** **8**

Generic Knowledge and Abilities Outline (Tier 3)

Printed: 06/01/2001

PWR RO Examination Outline

Form ES-401-5

Facility: WCGS

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.19	Ability to use plant computer to obtain and evaluate parametric information on system or component status.	3.0	1
	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	3.9	1
	2.1.30	Ability to locate and operate components, including local controls.	3.9	1
			Category Total:	**3**
Equipment Control	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4.0	1
	2.2.13	Knowledge of tagging and clearance procedures.	3.6	1
	2.2.33	Knowledge of control rod programming.	2.5	1
			Category Total:	**3**
Radiation Control	2.3.2	Knowledge of facility ALARA program.	2.5	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1
	2.3.9	Knowledge of the process for performing a containment purge.	2.5	1
	2.3.11	Ability to control radiation releases.	2.7	1
			Category Total:	**4**
Emergency Procedures/Plan	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. Note: The issue of setpoints and automatic safety features is not specifically covered in the systems sections.	3.9	1
	2.4.10	Knowledge of annunciator response procedures.	3.0	1
	2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.	2.8	1
			Category Total:	**3**
			Generic Total:	**13**

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	057 / AK3.01	Not Applicable. All actions are contained in AOP. No other K's were >2.5. Selected Ability. (BOTH EXAMS)
1/1	057 / 2.4.1	Not Applicable. All actions are contained in AOP. Selected Ability to ensure SRO Level.(SRO EXAM)
1/1	074 / 2.1.21	Ability measured during Dynamics and JPM's. Replaced with new generic KA. (RO EXAM)
1/1	015 / AA2.09	2 topics already selected from 015/017. Selected new subject. (SRO EXAM)
1/1	017 / 2.2.33	2 topics already selected from 015/017. Selected new subject. (SRO EXAM)
1/1	E09 / EA2.1	2 topics already selected from E09/E10. Selected new subject. (SRO EXAM)
1/2	058 / 2.2.11	Generic not applicable. Replaced with RO question to balance exam. (SRO EXAM)
1/2	E03 / 2.1.22	Generic KA Not Applicable to subject. Replaced with new generic KA.(SRO EXAM)
1/3	E13 / 2.1.10	Generic KA Not Applicable to subject. Replaced with new generic KA.(SRO EXAM)
1/3	056 / AA2.56	Replaced with RO question to balance the exam content. (SRO EXAM)
1/3	065 / AA1.01	Not applicable. Manual unloaders are not used. Selected new Ability. (RO EXAM)
2/1	017 K3.01	Test same concept as 017 A3.01. Replaced with K5.01 (RO EXAM)
2/1	025 / K1.03	Not applicable to WCGS. Selected new subject.(BOTH EXAMS)
2/1	025 / K3.01	Not applicable to WCGS. Selected new subject.(BOTH EXAMS)
2/1	061 / 2.3.1	Replaced RO question to balance the exam content. (SRO EXAM)
2/1	061 / K2.03	Not applicable to WCGS. Selected K2.02. (BOTH EXAMS)
2/1	071 / A2.03	Not applicable to WCGS. No rupture disks are used. Selected A2.09. (BOTH EXAMS)
2/1	071 / 2.2.23	Not applicable to WCGS. All LCO's have been moved out. Selected new Generic KA. (RO EXAM)
2/2	073 / A2.01	Replaced question to balance the exam content. New Subject. Exam contained excessive PRM topics. (BOTH EXAMS)
2/2	079 / K1.01	KA test same concept as A2.01. New subject selected to balance the exam content. (BOTH EXAMS)
2/3	076 / 2.2.10	Replaced with RO question to balance the exam content. (SRO EXAM)
2/3	076 / K4.03	Not applicable to WCGS. Changed to K4.01. (RO EXAM)

Random Selection: BOTH Exam

25 SROOnly KAs are first selected for the following categories:

Tier 1: A2 and G (7 KAs for each category are selected)
Tier 2 G (7 KAs are selected)
Tier 3 (1 KA for each category are selected)

System lists are generated based upon the following criteria:
Tier, SROGroup, Category, SROOnly = True in tblCFRs

Then 75 KAs are selected based upon systems selected with the following criteria:
Tier, SROGroup, Category

Select Tier, Group, and Category to add KAs to.

Generate Random Number Between 1 and number of systems in the list.

Begin Loop

1. Look for available system number in first system list in the same row as the random number. If system number is found, use it and blank out entry in first list. If a blank is found at that row number, then try to find system number in second list at same row number. If found, then use it and blank out entry in second list. If not found in second list, then generate another random number and go back to first list and look for new system.
2. Select the system in the same row as the random number.
3. Create list of KAs for Tier, SROGroup, and randomly selected system number.
4. Generate a random number between 1 and number of KAs in KA list.
5. Pick KA from KA list at the row designated by the random number.
6. Check to see if KA is in master list of KAs already selected. If it is in master list, then select another random number and select KA at that row number. If not selected, then add to master KA list.
7.Add same KA To BOTH Outlines.

Loop Back (until number of required KAs have been selected for specific tier, group, and category)

Go back to top of list until all tiers, groups, and categories have been cycled through.

This will fill the SRO Outline appropriately, but the RO Outline may not fill out evenly because of the mismatch between the RO and SRO groups. Therefore, after the 75 SRO KAs are selected, the program looks for RO categories in groups 1 and 2 that have no KAs selected, starting with Group 1 and K1 category. These empty categories are then have 1 KA added to each of them. This may result in groups with more than the required number of KAs. The program then adds the remaining required RO KAs.

Wolf Creek Initial Examinations
December, 2001

Examination Outline Review Comments
Reviewer: T. McKernon/ R. Lantz
Chief Examiner: H. Bundy

Written Exam:

Ensure reference examination copy designates which 10CFR55.43 topic area is represented by each SRO only question.

Walkthrough:

None

Admin:

SRO A4 looks like a simple question. Need to ask a second question for evaluation of conditions for EAL and Pars, or combine both into a JPM to evaluate, classify, determine PARS and fill out notification forms.

SRO A3 is non-discriminatory as written, add difficulty, such as determining stay-times, or ALARA calculations based on different scenario choices.

Simulator Scenarios:

Scenario 2, Event 7 and JPM B.1.d may have very similar actions... if so, replace JPM.