Fort Calhoun Station

NRC Hot License Exam Outline

Submitted to Mr. Tom McKernon, Chief Examiner

Scheduled Exam Dates : 6/22/01 - 6/29/01

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- SRO Written Exam Sample Plan (substitute forms for ES-401-3)

Administrative Topics Outline

- Form ES-301-1 (RO)
- Form ES-301-1 (SRO)

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Simulator Scenario Outline

- Form ES-D-1 for scenario #1
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- Form ES-D-1 for scenario #3
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- Forms 301-5 and 301-6

Copy of Form ES 201 -3 security agreement as it exists to date (submitted previously)

Form ES-201-2 Examination Outline Quality Checklist (submitted previously)

Proposed Schedule for FCS Exam

Friday - 6/22/01

0800- 1300 All take written exam

Monday - 6/25/01

1200 - 1400 Group One Simulator JPMs (Group One - USRO, 2 ROs)
1400 - 1530 Group Two Simulator JPMs (Group Two - 2 ROs, Surrogate SRO)
1530 - 1730 Group Three Simulator JPMs (Group Three - 3 ISROs)

Tuesday - 6/26/01

0700 -0900 Group One - Simulator Scenario One
0930 -1130 Group Two - Simulator Scenario One
1130 - 1230 Lunch
1230 - 1430 Group Three - Simulator Scenario One
1430 - 1630 Group Three - Simulator Scenario Three

Wedensday - 6/27/01

0700 -0900 Group One - Simulator Scenario two
0900 -1000 Group One - Admin
1000 - 1200 Group Two - Simulator Scenario two
1200 - 1300 Lunch
1300 - 1400 Group Two - Admin
1400 - 1600 Group Three - Simulator Scenario two
1600 - 1700 Group Three - Admin

Thursday - 6/28/01

0700 -0900 Group Three In-plant JPMs
0900 - 1100 Group One In-plant JPMs
1100 - 1200 Lunch
1200 - 1330 Group Two In-plant JPMs
1530 - Pre-exit meeting

Friday - 6/29/01

0800 EXIT

Outline Development for 6/2001 Fort Calhoun NRC Exam

This exam outline was developed in accordance with NUREG-1021, Rev 8, supplement 1. In addition, the NRC Region IV "Good Practices" document was used as a reference.

Written Exam Outline

Fort Calhoun as developed a methodology to ensure that the selection of K/A items for the written exam is random and unbiased. The written exam outline was developed using a Microsoft Access database. All K/A items from NUREG-1022, Rev 2 are contained in a table within the database. Items which clearly are not applicable to Fort Calhoun are assigned a flag to prevent them from being sampled. Flagged items include the Ice Condenser System K/A's, Non-Combustion Engineering vender specific EPE/APE K/A's, and K/A's only associated with multi-unit plants. The sample plan is developed as follows:

- A module is run that assigns a random number to each item in the K/A catalog. This module uses a "randomize" routine to ensure that the pattern of random numbers is unique.

- A query is run that presents K/A items belonging to the RO tier and group being sampled, with RO importance factors of 2.5 or greater, ordered by their associated random number. Items are entered in the sample plan as ordered, unless the item is not applicable to Fort Calhoun, not appropriate for a written exam or the system/event has already been sampled twice. This process is repeated until the tier/group has the required number of items.

- This process is repeated for each tier/group combination.

- The resulting sample plan is reviewed to determine if all associated categories have been adequately sampled for each tier. If any categories are undersampled, the most recently chosen items in the highest sampled categories are replaced by the next ordered items from the undersampled categories.

- A maximum of 75 K/A items, (74 in the case of this sample plan), also having SRO importance factor of 2.5 or greater are selected to also be used in the SRO exam.

- Additional items are selected for the SRO written exam to fill out the SRO tier/group requirements. These items a also presented in order of associate random number. An additional requirement, for this step, is that the selected K/A items must be applicable to SRO level questions.

Operating Exam Outline

The Fort Calhoun "PRA Summary Notebook" was used as a resource to ensure that risk-significant items identified in the Fort Calhoun IPE are reflected in the exam. This resulted in the following events being included in the operating exam:

- Failure of CCW due to interfacing LOCA- RCP seal cooler leak
- Loss of offsite power
- PORV failing open following transisent
- Loss of feedwater.

It also resulted in the following risk-significant operator actions being evaluated:

- Manually opening a Raw Water pump breaker to allow D/G to power vital bus.
- Minimizing DC loads
- Using FW-54 to makeup to the Emergency Feedwater storage tank.
- Initiating emergency boration
- Isolating RCS to CCW leak.
- Tripping RCPs with a loss of cooling water flow.
- Providing raw water backup cooling to components following a loss of CCW

Recent operating experience with failed fuel at Fort Calhoun is also reflected in the operating exam:

- A new SRO Administrative JPM is being developed to determine primary to secondary leak rate using RCS chemistry parameters and radiation monitor readings.

- A normal operational event in one of the scenarios involves placing an additional charging pump in operation to increase purification flow in response to increased RCS activity.

PWR RO Written Examination Outline Summary

System/Mode	System Title	K1	K2	K3	A1	A2	G	Points
EPE/APE Tier 1 / Group 1								
000015	Reactor Coolant Pump Malfunctions				1			1
000017	Reactor Coolant Pump Malfunctions (Loss of RC Flow)					1		1
000024	Emergency Boration						1	1
000026	Loss of Component Cooling Water					1	1	2
000040	Steam Line Rupture			1	1			2
000057	Loss of Vital AC Electrical Instrument Bus				1			1
000067	Plant Fire on Site					1		1
000068	Control Room Evacuation			1			1	2
000069	Loss of Containment Integrity						1	1
000074	Inadequate Core Cooling				1			1
CE-A11	RCS Overcooling				1			1
CE-A13	Natural Circulation Operations				1			1
CE-E05	Excess Steam Demand		1					1
			1	**2**	**6**	**3**	**4**	**16**
EPE/APE Tier 1 / Group 2								
000001	Continuous Rod Withdrawal	1						1
000003	Dropped Control Rod	1	1					2
000007	Reactor Trip					1		1
000008	Pressurizer Vapor Space Accident						1	1
000009	Small Break LOCA		1			1		2
000011	Large Break LOCA					1	1	2
000029	Anticipated Transient Without Scram (ATWS)	1					1	2
000033	Loss of Intermediate Range Nuclear Instrumentation					1		1
000038	Steam Generator Tube Rupture				1			1
000054	Loss of Main Feedwater				1			1
000058	Loss of DC Power			1				1
000059	Accidental Liquid Radwaste Release	1						1
000061	Area Radiation Monitoring (ARM) System Alarms		1					1
		4	**3**	**1**	**2**	**4**	**3**	**17**
EPE/APE Tier 1 / Group 3								
000036	Fuel Handling Incidents			1				1
000056	Loss of Off-Site Power						1	1
CE-A16	Excess RCS Leakage	1						1
		1		**1**			**1**	**3**
	Grand Total of EPE/APE K&A Selectio	**5**	**4**	**4**	**8**	**7**	**8**	**36**

PWR RO Written Examination Outline Summary

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System/Mod	System Title	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Points
Plant System Tier 2 / Group 1													
001000	Control Rod Drive System					1					1		2
003000	Reactor Coolant Pump System							1				1	2
004000	Chemical and Volume Control System	1					1						2
013000	Engineered Safety Features Actuation System					1						1	2
015000	Nuclear Instrumentation System			1					1				2
017000	In-Core Temperature Monitor System					1				1			2
022000	Containment Cooling System				1				1				2
059000	Main Feedwater System									1			1
061000	Auxiliary / Emergency Feedwater System		1				1						2
068000	Liquid Radwaste System	1							1				2
071000	Waste Gas Disposal System	1									1		2
072000	Area Radiation Monitoring System										1	1	2
		3	**1**	**1**	**1**	**3**	**2**	**1**	**3**	**2**	**3**	**3**	**23**
Plant System Tier 2 / Group 2													
002000	Reactor Coolant System					1		1					2
006000	Emergency Core Cooling System			1					1				2
010000	Pressurizer Pressure Control System		1					1					2
011000	Pressurizer Level Control System						1						1
012000	Reactor Protection System							1		1			2
035000	Steam Generator System				1			1					2
039000	Main and Reheat Steam System				1						1		2
055000	Condenser Air Removal System	1										1	2
062000	A.C. Electrical Distribution								1			1	2
064000	Emergency Diesel Generators										1	1	2
086000	Fire Protection System	1											1
		2	**1**	**1**	**2**	**1**	**1**	**4**	**2**	**1**	**2**	**3**	**20**
Plant System Tier 2 / Group 3													
008000	Component Cooling Water System											1	1
034000	Fuel Handling Equipment System										1		1
041000	Steam Dump System and Turbine Bypass Control											1	1
045000	Main Turbine Generator System							1				1	2
078000	Instrument Air System			1	1								2
103000	Containment System				1								1
				1	**2**			**1**			**1**	**3**	**8**
Grand Total of Plant System K&A Selecti		**5**	**2**	**3**	**5**	**4**	**3**	**6**	**5**	**3**	**6**	**9**	**51**

PWR RO Written Examination Outline Summary

System/Mode	System Title	Cat 1	Cat 2	Cat 3	Cat 4	Points
Generic Knowledge and Abilities Tier 3						
000000	Generic Knowledges and Abilities	4	2	2	5	13
		4	**2**	**2**	**5**	**13**
Grand Total of Generic K&A Selectic		**4**	**2**	**2**	**5**	**13**

PWR RO Written Examination Outline

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Tier 1 Group 1

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
000015	Reactor Coolant Pump Malfunctions	AA1.13	Ability to operate and / or monitor the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow):: Reactor power level indicators	3.4*	41.7 / 45.5 / 45.6
000017	Reactor Coolant Pump Malfunctions (Loss of RC Flow)	AA2.10	Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunc (Loss of RC Flow):: When to secure RCPs on loss of cooling or seal injection	3.7	43.5 / 45.13
000024	Emergency Boration	2.4.49	: Ability to perform without reference to procedures those actions that require immediate operatio system components and controls.	4.0	41.10 / 43.2 / 45.6
000026	Loss of Component Cooling Water	2.1.23	: Ability to perform specific system and integrated plant procedures during all modes of plant oper	3.9	45.2 / 45.6
000026	Loss of Component Cooling Water	AA2.06	Ability to determine and interpret the following as they apply to the Loss of Component Cooling Wa The length of time after the loss of CCW flow to a component before that component may be dam	2.8*	43.5 / 45.13
000040	Steam Line Rupture	AA1.22	Ability to operate and / or monitor the following as they apply to the Steam Line Rupture:: Load sequencer status lights	3.0*	41.7 / 45.5 / 45.6
000040	Steam Line Rupture	AK3.06	Knowledge of the reasons for the following responses as they apply to the Steam Line Rupture:: Containment temperature and pressure considerations	3.4	41.5 / 41.10 / 45.6 / 45.13
000057	Loss of Vital AC Electrical Instrument Bus	AA1.04	Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bu RWST and VCT valves	3.5	41.7 / 45.5 / 45.6
000067	Plant Fire on Site	AA2.16	Ability to determine and interpret the following as they apply to the Plant Fire on Site:: Vital equipm and control systems to be maintained and operated during a fire	3.3	43.5 / 45.13
000068	Control Room Evacuation	2.4.31	: Knowledge of annunciators alarms and indications, and use of the response instructions.	3.3	41.10 / 45.3
000068	Control Room Evacuation	AK3.07	Knowledge of the reasons for the following responses as they apply to the Control Room Evacua Maintenance of S/G level, using AFW flow control valves	4.0	41.5 / 41.10 / 45.6 / 45.13

PWR RO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
000069	Loss of Containment Integrity	2.4.50	: Ability to verify system alarm setpoints and operate controls identified in the alarm response mar	3.3	45.3
000074	Inadequate Core Cooling	EA1.21	Ability to operate and monitor the following as they apply to a Inadequate Core Cooling:: Condensa storage tank level gauge	3.7	41.7 / 45.5 / 45.6
CE-A11	RCS Overcooling	AA1.02	Ability to operate and / or monitor the following as they apply to the (RCS Overcooling): Operating behavior characteristics of the facility.	3.2	41.7 / 45.5 / 45.6
CE-A13	Natural Circulation Operations	AA1.01	Ability to operate and / or monitor the following as they apply to the (Natural Circulation Operation Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.3	41.7 / 45.5 / 45.6
CE-E05	Excess Steam Demand	EK2.01	Knowledge of the interrelations between the (Excess Steam Demand) and the following:: Compor and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.3	41.7 / 45.7

PWR RO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
Tier 1	Group 2				
000001	Continuous Rod Withdrawal	AK1.21	Knowledge of the operational implications of the following concepts as they apply to Continuous Withdrawal:: Integral rod worth	2.9	41.8 / 41.10 / 45.3
000003	Dropped Control Rod	AK1.19	Knowledge of the operational implications of the following concepts as they apply to Dropped Co Rod:: Differential rod worth	2.8	41.8 / 41.10 / 45.3
000003	Dropped Control Rod	AK2.03	Knowledge of the interrelations between the Dropped Control Rod and the following:: Metroscope	3.1*	41.7 / 45.7
000007	Reactor Trip	EA2.02	Ability to determine or interpret the following as they apply to a reactor trip:: Proper actions to be t if the automatic safety functions have not taken place	4.3	41.7 / 45.5 / 45.6
000008	Pressurizer Vapor Space Accident	2.4.31	: Knowledge of annunciators alarms and indications, and use of the response instructions.	3.3	41.10 / 45.3
000009	Small Break LOCA	EA2.19	Ability to determine or interpret the following as they apply to a small break LOCA:: Containment a cooler run indication	2.7	43.5 / 45.13
000009	Small Break LOCA	EK2.03	Knowledge of the interrelations between the small break LOCA and the following:: S/Gs	3.0	41.7 / 45.7
000011	Large Break LOCA	2.4.50	: Ability to verify system alarm setpoints and operate controls identified in the alarm response mar	3.3	45.3
000011	Large Break LOCA	EA2.05	Ability to determine or interpret the following as they apply to a Large Break LOCA:: Significance charging pump operation	3.3	43.5 / 45.13
000029	Anticipated Transient Without Scram (ATWS)	2.4.31	: Knowledge of annunciators alarms and indications, and use of the response instructions.	3.3	41.10 / 45.3
000029	Anticipated Transient Without Scram (ATWS)	EK1.02	Knowledge of the operational implications of the following concepts as they apply to the ATWS:: Definition of reactivity	2.6	41.8 / 41.10 / 45.3

PWR RO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
000033	Loss of Intermediate Range Nuclear Instrumentation	AA2.01	Ability to determine and interpret the following as they apply to the Loss of Intermediate Range Nu Instrumentation:: Equivalency between source-range, intermediate-range, and power-range chan readings	3.0	43.5 / 45.13
000038	Steam Generator Tube Rupture	EA1.14	Ability to operate and monitor the following as they apply to a SGTR:: AFW pump control and flov indicators	4.1	41.7 / 45.5 / 45.6
000054	Loss of Main Feedwater	AA1.02	Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFV Manual startup of electric and steam-driven AFW pumps	4.4	41.7 / 45.5 / 45.6
000058	Loss of DC Power	AK3.01	Knowledge of the reasons for the following responses as they apply to the Loss of DC Power:: L dc control power by D/Gs	3.4*	41.5 / 41.10 / 45.6 / 45.1
000059	Accidental Liquid Radwaste Release	AK1.01	Knowledge of the operational implications of the following concepts as they apply to Accidental L Radwaste Release:: Types of radiation, their units of intensity and the location of the sources of radiation in a nuclear power plant	2.7	41.8 / 41.10 / 45.3
000061	Area Radiation Monitoring (ARM) System Alarms	AK2.01	Knowledge of the interrelations between the Area Radiation Monitoring (ARM) System Alarms an following:: Detectors at each ARM system location	2.5*	41.7 / 45.7

PWR RO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
Tier 1		Group 3			
000036	Fuel Handling Incidents	AK3.01	Knowledge of the reasons for the following responses as they apply to the Fuel Handling Inciden Different inputs that will cause a reactor building evacuation	3.1	41.5 / 41.10 / 45.6 / 45.13
000056	Loss of Off-Site Power	2.1.30	: Ability to locate and operate components, including local controls.	3.9	41.7 / 45.7
CE-A16	Excess RCS Leakage	AK1.01	Knowledge of the operational implications of the following concepts as they apply to the (Excess Leakage): Components, capacity, and function of emergency systems.	3.2	41.8 / 41.10 / 45.3

PWR RO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
Tier 2		Group 1			
001000	Control Rod Drive System	A4.10	Ability to manually operate and/or monitor in the control room:: Determination of an ECP	3.5	
001000	Control Rod Drive System	K5.38	Knowledge of the following operational implications as they apply to the CRDS:: Definition of xend transient; causes; effects on reactivity	3.5	41.5 / 45.7
003000	Reactor Coolant Pump System	2.4.31	: Knowledge of annunciators alarms and indications, and use of the response instructions.	3.3	41.10 / 45.3
003000	Reactor Coolant Pump System	A1.06	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) assoc with operating the RCPS controls including:: PZR spray flow	2.9	41.5 / 45.5
004000	Chemical and Volume Control System	K1.17	Knowledge of the physical connections and/or cause-effect relationships between the CVCS and following systems:: PZR	3.4	41.2 to 41.9 / 45.7 to 45.8
004000	Chemical and Volume Control System	K6.09	Knowledge of the effect of a loss or malfunction on the following CVCS components:: Purpose of divert valve	2.8	41.7 / 45.7
013000	Engineered Safety Features Actuation System	2.1.02	: Knowledge of operator responsibilities during all modes of plant operation.	3.0	41.10 / 45.13
013000	Engineered Safety Features Actuation System	K5.02	Knowledge of the operational implications of the following concepts as they apply to the ESFAS:: Safety system logic and reliability	2.9	41.5 / 45.7
015000	Nuclear Instrumentation System	A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the NIS; and (b bas on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:: Xenon oscillations	3.2	41.5 / 43.5 / 45.3 / 45.5
015000	Nuclear Instrumentation System	K3.01	Knowledge of the effect that a loss or malfunction of the NIS will have on the following:: RPS	3.9	41.7 / 45.6
017000	In-Core Temperature Monitor System	A3.02	Ability to monitor automatic operation of the ITM system including:: Measurement of in-core thermocouple temperatures at panel outside control room	3.4*	41.7 / 45.5

PWR RO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
017000	In-Core Temperature Monitor System	K5.03	Knowledge of the operational implications of the following concepts as they apply to the ITM syste Indication of superheating	3.7	41.5 / 45.7
022000	Containment Cooling System	A2.01	Ability to (a) predict the impacts of the following malfunctions or operationson the CCS; and (b) ba on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:: Fan motor over-current	2.5	41.5 / 43.5 / 45.3 / 45.13
022000	Containment Cooling System	K4.03	Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following:: Automa containment isolation	3.6*	41.7
059000	Main Feedwater System	A3.06	Ability to monitor automatic operation of the MFW, including:: Feedwater isolation	3.2*	41.7 / 45.5
061000	Auxiliary / Emergency Feedwater Syster	K2.03	Knowledge of bus power supplies to the following:: AFW diesel driven pump	4.0*	41.7
061000	Auxiliary / Emergency Feedwater Syster	K6.01	Knowledge of the effect of a loss or malfunction of the following will have on the AFW componer Controllers and positioners	2.5	41.7 / 45.7
068000	Liquid Radwaste System	A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the Liquid Radwas System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:: Lack of tank recirculation prior to release	2.7*	41.5 / 43.5 / 45.3 / 45.13
068000	Liquid Radwaste System	K1.02	Knowledge of the physical connections and/or cause effect relationships between the Liquid Ra System and the following systems:: Waste gas vent header	2.5	41.2 to 41.9 / 45.7 to 45.8
071000	Waste Gas Disposal System	A4.30	Ability to manually operate and/or monitor in the control room:: Water drainage from the WGOS de tanks	2.9*	41.7 / 45.5 to 45.8
071000	Waste Gas Disposal System	K1.06	Knowledge of the physical connections and/or cause-effect relationships between the Waste Ga Disposal System and the following systems:: ARM and PRM systems	3.1*	41.2 to 41.9 / 45.7 to 45.8
072000	Area Radiation Monitoring System	2.1.32	: Ability to explain and apply all system limits and precautions.	3.4	41.10 / 43.2 / 45.12

PWR RO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
072000	Area Radiation Monitoring System	A4.01	Ability to manually operate and/or monitor in the control room:: Alarm and interlock setpoint checks and adjustments	3.0*	41.7 / 45.5 to 45.8

PWR RO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
Tier 2		Group 2			
002000	Reactor Coolant System	A1.12	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) assoc with operating the RCS controls including:: Radioactivity level when vending CRDS	2.9	41.5 / 45.7
002000	Reactor Coolant System	K5.01	Knowledge of the operational implications of the following concepts as they apply to the RCS:: Ba heat transfer concepts	3.1	41.5 / 45.7
006000	Emergency Core Cooling System	A2.10	Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of t malfunctions or operations:: Low boron concentration in SIS.	3.4	41.5 / 45.5
006000	Emergency Core Cooling System	K3.01	Knowledge of the effect that a loss or malfunction of the ECCS will have on the following:: RCS	4.1	41.7 / 45.6
010000	Pressurizer Pressure Control System	A1.05	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) assoc with operating the PZR PCS controls including:: Pressure effect on level	2.8	41.5 / 45.5
010000	Pressurizer Pressure Control System	K2.04	Knowledge of bus power supplies to the following:: Indicator for code safety position	2.7*	41.7
011000	Pressurizer Level Control System	K6.03	Knowledge of the effect of a loss or malfunction on the following will have on the PZR LCS:: Relationship between PZR level and PZR heater control circuit	2.9	41.7 / 45.7
012000	Reactor Protection System	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*	41.5 / 45.5
012000	Reactor Protection System	A3.05	Ability to monitor automatic operation of the RPS, including:: Single and multiple channel trip indicat	3.6	41.7 / 45.5
035000	Steam Generator System	A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) assoc with operating the S/GS controls including:: S/G wide and narrow range level during startup, shutdown, and normal operations	3.6	41.5 / 45.5
035000	Steam Generator System	K4.02	Knowledge of S/GS design feature(s) and/or interlock(s) which provide for the following:: S/G lev indication	3.2	41.7

PWR RO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
039000	Main and Reheat Steam System	A4.01	Ability to manually operate and/or monitor in the control room:: Main steam supply. valves	2.9*	41.7 / 45.5 to 45.8
039000	Main and Reheat Steam System	K4.06	Knowledge of MRSS design feature(s) and/or interlock(s) which provide for the following:: Preve reverse steam flow on steam line break	3.3	41.7
055000	Condenser Air Removal System	2.1.30	: Ability to locate and operate components, including local controls.	3.9	41.7 / 45.7
055000	Condenser Air Removal System	K1.06	Knowledge of the physical connections and/or cause-effect relationships between the CARS and following systems:: PRM system	2.6	41.2 to 41.9 / 45.7 to 45.8
062000	A.C. Electrical Distribution	2.1.27	: Knowledge of system purpose and or function.	2.8	41.7
062000	A.C. Electrical Distribution	A2.10	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:: Effects of switching power supplies on instruments and controls	3.0	41.5 / 43.5 / 45.3 / 45.13
064000	Emergency Diesel Generators	2.1.23	: Ability to perform specific system and integrated plant procedures during all modes of plant oper	3.9	45.2 / 45.6
064000	Emergency Diesel Generators	A4.06	Ability to manually operate and/or monitor in the control room:: Manual start, loading, and stopping the ED/G	3.9	41.7 / 45.5 to 45.8
086000	Fire Protection System	K1.01	Knowledge of the physical connections and/or cause-effect relationships between the Fire Prote System and the following systems:: High-pressure service water	3.0*	41.2 to 41.9 / 45.7 to 45.8

PWR RO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
Tier 2		Group 3			
008000	Component Cooling Water System	2.4.49	: Ability to perform without reference to procedures those actions that require immediate operatio system components and controls.	4.0	41.10 / 43.2 / 45.6
034000	Fuel Handling Equipment System	A4.02	Ability to manually operate and/or monitor in the control room:: Neutron levels	3.5	41.7 / 45.5 to 45.8
041000	Steam Dump System and Turbine Bypass Control	2.4.49	: Ability to perform without reference to procedures those actions that require immediate operatio system components and controls.	4.0	41.10 / 43.2 / 45.6
045000	Main Turbine Generator System	2.4.49	: Ability to perform without reference to procedures those actions that require immediate operatio system components and controls.	4.0	41.10 / 43.2 / 45.6
045000	Main Turbine Generator System	A1.06	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) assoc with operating the MT/G system controls including:: Expected response of secondary plant parameters following T/G trip	3.3	41.5 / 45.5
078000	Instrument Air System	K3.02	Knowledge of the effect that a loss or malfunction of the IAS will have on the following:: Systems having pneumatic valves and controls	3.4	41.7 / 45.6
078000	Instrument Air System	K4.03	Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following:: Securin SAS upon loss of cooling water	3.1*	41.7
103000	Containment System	K4.06	Knowledge of containment system design feature(s) and/or interlock(s) which provide for the following:: Containment isolation system	3.1	41.7

PWR RO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
Tier 3		Group 4			
000000	Generic Knowledges and Abilities	2.1.01	: Knowledge of conduct of operations requirements.	3.7	41.10 / 45.13
000000	Generic Knowledges and Abilities	2.1.20	: Ability to execute procedure steps.	4.3	41.10 / 43.5 / 45.12
000000	Generic Knowledges and Abilities	2.1.25	: Ability to obtain and interpret station reference materials such as graphs, monographs, and table which contain performance data.	2.8	41.10 / 43.5 / 45.12
000000	Generic Knowledges and Abilities	2.1.33	: Ability to recognize indications for system operating parameters which are entry-level condition technical specifications.	3.4	43.2 / 43.3 / 45.3
000000	Generic Knowledges and Abilities	2.2.01	: Ability to perform pre-startup procedures for the facility, including operating those controls asso with plant equipment that could affect reactivity.	3.7	45.1
000000	Generic Knowledges and Abilities	2.2.22	: Knowledge of limiting conditions for operations and safety limits.	3.4	43.2 / 45.2
000000	Generic Knowledges and Abilities	2.3.02	: Knowledge of facility ALARA program.	2.5	41.12 / 43.4 / 45.9 / 45.10
000000	Generic Knowledges and Abilities	2.3.11	: Ability to control radiation releases.	2.7	45.9 / 45.10
000000	Generic Knowledges and Abilities	2.4.08	: Knowledge of how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom-based EOPs.	3.0	41.10 / 43.5 / 45.13
000000	Generic Knowledges and Abilities	2.4.09	: Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitig strategies.	3.3	41.10 / 43.5 / 45.13
000000	Generic Knowledges and Abilities	2.4.10	: Knowledge of annunciator response procedures.	3.0	41.10 / 43.5 / 45.13

PWR RO Written Examination Outline (Last Page)

System/Mode	System Title	KA Number	Title	RO Value	10 CFR 55
000000	Generic Knowledges and Abilities	2.4.16	: Knowledge of EOP implementation hierarchy and coordination with other support procedures.	3.0	41.10 / 43.5 / 45.13
000000	Generic Knowledges and Abilities	2.4.25	: Knowledge of fire protection procedures.	2.9	41.10 / 45.13

PWR SRO Written Examination Outline Summary

System/Mode	System Title	K1	K2	K3	A1	A2	G	Points
EPE/APE Tier 1 / Group 1								
000001	Continuous Rod Withdrawal	1						1
000003	Dropped Control Rod	1	1					2
000011	Large Break LOCA					1	1	2
000015	Reactor Coolant Pump Malfunctions				1			1
000017	Reactor Coolant Pump Malfunctions (Loss of RC Flow)					1		1
000024	Emergency Boration						1	1
000026	Loss of Component Cooling Water					1	1	2
000029	Anticipated Transient Without Scram (ATWS)	1					1	2
000040	Steam Line Rupture				1			1
000055	Station Blackout						1	1
000057	Loss of Vital AC Electrical Instrument Bus				1	1		2
000059	Accidental Liquid Radwaste Release	1						1
000067	Plant Fire on Site					1	1	2
000068	Control Room Evacuation			1			1	2
000069	Loss of Containment Integrity						1	1
000074	Inadequate Core Cooling				1			1
CE-A11	RCS Overcooling						1	1
		4	**1**	**1**	**4**	**5**	**9**	**24**
EPE/APE Tier 1 / Group 2								
000007	Reactor Trip				1	1		2
000008	Pressurizer Vapor Space Accident						1	1
000009	Small Break LOCA		1			1		2
000027	Pressurizer Pressure Control System Malfunction	1						1
000032	Loss of Source Range Nuclear Instrumentation					1		1
000033	Loss of Intermediate Range Nuclear Instrumentation					1		1
000038	Steam Generator Tube Rupture				1	1		2
000054	Loss of Main Feedwater				1		1	2
000058	Loss of DC Power			1		1		2
000061	Area Radiation Monitoring (ARM) System Alarms		1					1
CE-E09	Functional Recovery						1	1
		1	**2**	**1**	**3**	**6**	**3**	**16**
EPE/APE Tier 1 / Group 3								
000056	Loss of Off-Site Power					1	1	2
CE-A16	Excess RCS Leakage	1						1
		1				**1**	**1**	**3**

PWR SRO Written Examination Outline Summary

System/Mode	System Title	K1	K2	K3	A1	A2	G	Points
	Grand Total of EPE/APE K&A Selectio	6	3	2	7	12	13	43

PWR SRO Written Examination Outline Summary

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System/Mode	System Title	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Points
Plant System Tier 2 / Group 1													
001000	Control Rod Drive System					1					1		2
003000	Reactor Coolant Pump System							1					1
004000	Chemical and Volume Control System	1					1						2
013000	Engineered Safety Features Actuation System					1						1	2
015000	Nuclear Instrumentation System			1					1				2
017000	In-Core Temperature Monitor System					1				1			2
026000	Containment Spray System				1								1
059000	Main Feedwater System									1			1
061000	Auxiliary / Emergency Feedwater System		1							1			2
068000	Liquid Radwaste System								1				1
071000	Waste Gas Disposal System	1									1		2
072000	Area Radiation Monitoring System										1		1
		2	**1**	**1**	**1**	**3**	**1**	**1**	**2**	**3**	**3**	**1**	**19**
Plant System Tier 2 / Group 2													
002000	Reactor Coolant System							1					1
006000	Emergency Core Cooling System								1				1
010000	Pressurizer Pressure Control System		1					1					2
016000	Non-Nuclear Instrumentation System			1								1	2
034000	Fuel Handling Equipment System						1				1		2
035000	Steam Generator System							1					1
039000	Main and Reheat Steam System										1		1
055000	Condenser Air Removal System											1	1
062000	A.C. Electrical Distribution											1	1
064000	Emergency Diesel Generators										1	1	2
086000	Fire Protection System	1											1
103000	Containment System				1				1				2
		1	**1**	**1**	**1**		**1**	**3**	**2**		**3**	**4**	**17**
Plant System Tier 2 / Group 3													
008000	Component Cooling Water System											1	1
041000	Steam Dump System and Turbine Bypass Control					1						1	2
045000	Main Turbine Generator System											1	1
						1						**3**	**4**
Grand Total of Plant System K&A Selecti		**3**	**2**	**2**	**2**	**4**	**2**	**4**	**4**	**3**	**6**	**8**	**40**

PWR SRO Written Examination Outline Summary

System/Mode	System Title	Cat 1	Cat 2	Cat 3	Cat 4	Points
Generic Knowledge and Abilities Tier 3						
000000	Generic Knowledges and Abilities	4	6	2	5	17
		4	**6**	**2**	**5**	**17**
	Grand Total of Generic K&A Selectic	**4**	**6**	**2**	**5**	**17**

PWR SRO Written Examination Outline

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
Tier 1	Group 1				
000001	Continuous Rod Withdrawal	AK1.21	Knowledge of the operational implications of the following concepts as they apply to Continuous Withdrawal:: Integral rod worth	3.2	41.8 / 41.10 / 45.3
000003	Dropped Control Rod	AK1.19	Knowledge of the operational implications of the following concepts as they apply to Dropped Co Rod:: Differential rod worth	2.9	41.8 / 41.10 / 45.3
000003	Dropped Control Rod	AK2.03	Knowledge of the interrelations between the Dropped Control Rod and the following:: Metroscope	3.2*	41.7 / 45.7
000011	Large Break LOCA	2.4.50	: Ability to verify system alarm setpoints and operate controls identified in the alarm response mar	3.3	45.3
000011	Large Break LOCA	EA2.05	Ability to determine or interpret the following as they apply to a Large Break LOCA:: Significance charging pump operation	3.7*	43.5 / 45.13
000015	Reactor Coolant Pump Malfunctions	AA1.13	Ability to operate and / or monitor the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow):: Reactor power level indicators	3.4*	41.7 / 45.5 / 45.6
000017	Reactor Coolant Pump Malfunctions (Loss of RC Flow)	AA2.10	Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunc (Loss of RC Flow):: When to secure RCPs on loss of cooling or seal injection	3.7	43.5 / 45.13
000024	Emergency Boration	2.4.49	: Ability to perform without reference to procedures those actions that require immediate operatio system components and controls.	4.0	41.10 / 43.2 / 45.6
000026	Loss of Component Cooling Water	2.1.23	: Ability to perform specific system and integrated plant procedures during all modes of plant oper	4.0	45.2 / 45.6
000026	Loss of Component Cooling Water	AA2.06	Ability to determine and interpret the following as they apply to the Loss of Component Cooling Wa The length of time after the loss of CCW flow to a component before that component may be dam	3.1*	43.5 / 45.13
000029	Anticipated Transient Without Scram (ATWS)	2.4.31	: Knowledge of annunciators alarms and indications, and use of the response instructions.	3.4	41.10 / 45.3

PWR SRO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
000029	Anticipated Transient Without Scram (ATWS)	EK1.02	Knowledge of the operational implications of the following concepts as they apply to the ATWS:: Definition of reactivity	2.8	41.8 / 41.10 / 45.3
000040	Steam Line Rupture	AA1.22	Ability to operate and / or monitor the following as they apply to the Steam Line Rupture:: Load sequencer status lights	3.0*	41.7 / 45.5 / 45.6
000055	Station Blackout	2.1.32	: Ability to explain and apply all system limits and precautions.	3.8	41.10 / 43.2 / 45.12
000057	Loss of Vital AC Electrical Instrument Bus	AA1.04	Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bu RWST and VCT valves	3.6	41.7 / 45.5 / 45.6
000057	Loss of Vital AC Electrical Instrument Bus	AA2.16	Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bu Normal and abnormal PZR level for various modes of plant operation	3.1	43.5 / 45.13
000059	Accidental Liquid Radwaste Release	AK1.01	Knowledge of the operational implications of the following concepts as they apply to Accidental L Radwaste Release:: Types of radiation, their units of intensity and the location of the sources of radiation in a nuclear power plant	3.1	41.8 / 41.10 / 45.3
000067	Plant Fire on Site	2.1.32	: Ability to explain and apply all system limits and precautions.	3.8	41.10 / 43.2 / 45.12
000067	Plant Fire on Site	AA2.16	Ability to determine and interpret the following as they apply to the Plant Fire on Site:: Vital equipm and control systems to be maintained and operated during a fire	4.0	43.5 / 45.13
000068	Control Room Evacuation	2.4.31	: Knowledge of annunciators alarms and indications, and use of the response instructions.	3.4	41.10 / 45.3
000068	Control Room Evacuation	AK3.07	Knowledge of the reasons for the following responses as they apply to the Control Room Evacua Maintenance of S/G level, using AFW flow control valves	4.3	41.5 / 41.10 / 45.6 / 45.13
000069	Loss of Containment Integrity	2.4.50	: Ability to verify system alarm setpoints and operate controls identified in the alarm response mar	3.3	45.3

PWR SRO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
000074	Inadequate Core Cooling	EA1.21	Ability to operate and monitor the following as they apply to a Inadequate Core Cooling:: Condensa storage tank level gauge	3.7	41.7 / 45.5 / 45.6
CE-A11	RCS Overcooling	2.1.14	: Knowledge of system status criteria which require the notification of plant personnel.	3.3	43.5 / 45.12

PWR SRO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
Tier 1		Group 2			
000007	Reactor Trip	EA1.05	Ability to operate and monitor the following as they apply to a reactor trip:: Nuclear instrumentatio	4.1	41.7 / 45.5 / 45.6
000007	Reactor Trip	EA2.02	Ability to determine or interpret the following as they apply to a reactor trip:: Proper actions to be t if the automatic safety functions have not taken place	4.6	41.7 / 45.5 / 45.6
000008	Pressurizer Vapor Space Accident	2.4.31	: Knowledge of annunciators alarms and indications, and use of the response instructions.	3.4	41.10 / 45.3
000009	Small Break LOCA	EA2.19	Ability to determine or interpret the following as they apply to a small break LOCA:: Containment ai cooler run indication	3.1	43.5 / 45.13
000009	Small Break LOCA	EK2.03	Knowledge of the interrelations between the small break LOCA and the following:: S/Gs	3.3*	41.7 / 45.7
000027	Pressurizer Pressure Control System Malfunction	AK1.02	Knowledge of the operational implications of the following concepts as they apply to Pressurizer Pressure Control Malfunctions:: Expansion of liquids as temperature increases	3.1	41.8 / 41.10 / 45.3
000032	Loss of Source Range Nuclear Instrumentation	AA2.08	Ability to determine and interpret the following as they apply to the Loss of Source Range Nuclear Instrumentation:: Testing required if power lost, then restored	3.1	43.5 / 45.13
000033	Loss of Intermediate Range Nuclear Instrumentation	AA2.01	Ability to determine and interpret the following as they apply to the Loss of Intermediate Range Nu Instrumentation:: Equivalency between source-range, intermediate-range, and power-range chan readings	3.5	43.5 / 45.13
000038	Steam Generator Tube Rupture	EA1.14	Ability to operate and monitor the following as they apply to a SGTR:: AFW pump control and flo indicators	3.9	41.7 / 45.5 / 45.6
000038	Steam Generator Tube Rupture	EA2.14	Ability to determine or interpret the following as they apply to a SGTR:: Magnitude of atmospheric radioactive release if cooldown must be completed using steam dumps or if atmospheric reliefs lif	4.6	43.5 / 45.13
000054	Loss of Main Feedwater	2.2.25	: Knowledge of bases in technical specifications for limiting conditions for operations and safety li	3.7	43.2

PWR SRO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
000054	Loss of Main Feedwater	AA1.02	Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW Manual startup of electric and steam-driven AFW pumps	4.4	41.7 / 45.5 / 45.6
000058	Loss of DC Power	AA2.01	Ability to determine and interpret the following as they apply to the Loss of DC Power:: That a los dc power has occurred; verification that substitute power sources have come on line	4.1	43.5 / 45.13
000058	Loss of DC Power	AK3.01	Knowledge of the reasons for the following responses as they apply to the Loss of DC Power:: U dc control power by D/Gs	3.7	41.5 / 41.10 / 45.6 / 45.1
000061	Area Radiation Monitoring (ARM) System Alarms	AK2.01	Knowledge of the interrelations between the Area Radiation Monitoring (ARM) System Alarms an following:: Detectors at each ARM system location	2.6*	41.7 / 45.7
CE-E09	Functional Recovery	2.1.14	: Knowledge of system status criteria which require the notification of plant personnel.	3.3	43.5 / 45.12

PWR SRO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
Tier 1		Group 3			
000056	Loss of Off-Site Power	2.1.30	: Ability to locate and operate components, including local controls.	3.4	41.7 / 45.7
000056	Loss of Off-Site Power	AA2.56	Ability to determine and interpret the following as they apply to the Loss of Offsite Power:: RCS T	3.7	43.5 / 45.13
CE-A16	Excess RCS Leakage	AK1.01	Knowledge of the operational implications of the following concepts as they apply to the (Excess Leakage): Components, capacity, and function of emergency systems.	3.5	41.8 / 41.10 / 45.3

PWR SRO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
Tier 2		Group 1			
001000	Control Rod Drive System	A4.10	Ability to manually operate and/or monitor in the control room:: Determination of an ECP	3.9	
001000	Control Rod Drive System	K5.38	Knowledge of the following operational implications as they apply to the CRDS:: Definition of xenc transient; causes; effects on reactivity	4.1	41.5 / 45.7
003000	Reactor Coolant Pump System	A1.06	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) assoc with operating the RCPS controls including:: PZR spray flow	3.1	41.5 / 45.5
004000	Chemical and Volume Control System	K1.17	Knowledge of the physical connections and/or cause-effect relationships between the CVCS and following systems:: PZR	3.4	41.2 to 41.9 / 45.7 to 45.8
004000	Chemical and Volume Control System	K6.09	Knowledge of the effect of a loss or malfunction on the following CVCS components:: Purpose of divert valve	3.1	41.7 / 45.7
013000	Engineered Safety Features Actuation System	2.1.02	: Knowledge of operator responsibilities during all modes of plant operation.	4.0	41.10 / 45.13
013000	Engineered Safety Features Actuation System	K5.02	Knowledge of the operational implications of the following concepts as they apply to the ESFAS:: Safety system logic and reliability	3.3	41.5 / 45.7
015000	Nuclear Instrumentation System	A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the NIS; and (b bas on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:: Xenon oscillations	3.5*	41.5 / 43.5 / 45.3 / 45.5
015000	Nuclear Instrumentation System	K3.01	Knowledge of the effect that a loss or malfunction of the NIS will have on the following:: RPS	4.3	41.7 / 45.6
017000	In-Core Temperature Monitor System	A3.02	Ability to monitor automatic operation of the ITM system including:: Measurement of in-core thermocouple temperatures at panel outside control room	3.1*	41.7 / 45.5
017000	In-Core Temperature Monitor System	K5.03	Knowledge of the operational implications of the following concepts as they apply to the ITM syste Indication of superheating	4.1	41.5 / 45.7

PWR SRO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
026000	Containment Spray System	K4.09	Knowledge of CSS design feature(s) and/or interlock(s) which provide for the following:: Preven path for escape of radioactivity from containment to the outside (interlock on RWST isolation after swapover)	4.1*	41.7
059000	Main Feedwater System	A3.05	Ability to monitor automatic operation of the MFW, including:: Starts and stops on the main feed pumps	2.7*	41.7 / 45.5
061000	Auxiliary / Emergency Feedwater Syster	A3.02	Ability to monitor automatic operation of the AFW, including:: RCS cooldown during AFW operation	4.0	41.7 / 45.5
061000	Auxiliary / Emergency Feedwater Syster	K2.03	Knowledge of bus power supplies to the following:: AFW diesel driven pump	3.8*	41.7
068000	Liquid Radwaste System	A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the Liquid Radwas System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:: Lack of tank recirculation prior to release	2.8*	41.5 / 43.5 / 45.3 / 45.13
071000	Waste Gas Disposal System	A4.30	Ability to manually operate and/or monitor in the control room:: Water drainage from the WGOS de tanks	2.6*	41.7 / 45.5 to 45.8
071000	Waste Gas Disposal System	K1.06	Knowledge of the physical connections and/or cause-effect relationships between the Waste Ga Disposal System and the following systems:: ARM and PRM systems	3.1	41.2 to 41.9 / 45.7 to 45.8
072000	Area Radiation Monitoring System	A4.01	Ability to manually operate and/or monitor in the control room:: Alarm and interlock setpoint checks and adjustments	3.3	41.7 / 45.5 to 45.8

PWR SRO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
Tier 2		Group 2			
002000	Reactor Coolant System	A1.12	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) assoc with operating the RCS controls including:: Radioactivity level when vending CRDS	3.3	41.5 / 45.7
006000	Emergency Core Cooling System	A2.10	Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of t malfunctions or operations:: Low boron concentration in SIS.	3.9	41.5 / 45.5
010000	Pressurizer Pressure Control System	A1.05	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) assoc with operating the PZR PCS controls including:: Pressure effect on level	2.9	41.5 / 45.5
010000	Pressurizer Pressure Control System	K2.04	Knowledge of bus power supplies to the following:: Indicator for code safety position	2.9*	41.7
016000	Non-Nuclear Instrumentation System	2.2.22	: Knowledge of limiting conditions for operations and safety limits.	4.1	43.2 / 45.2
016000	Non-Nuclear Instrumentation System	K3.10	Knowledge of the effect that a loss or malfunction of the NNIS will have on the following:: CCS	3.2*	41.7 / 45.6
034000	Fuel Handling Equipment System	A4.02	Ability to manually operate and/or monitor in the control room:: Neutron levels	3.9	41.7 / 45.5 to 45.8
034000	Fuel Handling Equipment System	K6.02	Knowledge of the effect of a loss or malfunction on the following will have on the Fuel Handling System :: Radiation monitoring systems	3.3	41.7 / 45.7
035000	Steam Generator System	A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) assoc with operating the S/GS controls including:: S/G wide and narrow range level during startup, shutdown, and normal operations	3.8	41.5 / 45.5
039000	Main and Reheat Steam System	A4.01	Ability to manually operate and/or monitor in the control room:: Main steam supply. valves	2.8*	41.7 / 45.5 to 45.8
055000	Condenser Air Removal System	2.1.30	: Ability to locate and operate components, including local controls.	3.4	41.7 / 45.7

PWR SRO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
062000	A.C. Electrical Distribution	2.1.27	: Knowledge of system purpose and or function.	2.9	41.7
064000	Emergency Diesel Generators	2.1.23	: Ability to perform specific system and integrated plant procedures during all modes of plant oper	4.0	45.2 / 45.6
064000	Emergency Diesel Generators	A4.06	Ability to manually operate and/or monitor in the control room:: Manual start, loading, and stopping the ED/G	3.9	41.7 / 45.5 to 45.8
086000	Fire Protection System	K1.01	Knowledge of the physical connections and/or cause-effect relationships between the Fire Prote System and the following systems:: High-pressure service water	3.4*	41.2 to 41.9 / 45.7 to 45.8
103000	Containment System	A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the containment sy and (b) based on those predictions, use procedures to correct, control, or mitigate the consequer of those malfunctions or operations: Containment evacuation (including recognition of the alarm)	3.6*	41.5 / 43.5 / 45.3 / 45.13
103000	Containment System	K4.06	Knowledge of containment system design feature(s) and/or interlock(s) which provide for the following:: Containment isolation system	3.7	41.7

PWR SRO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
Tier 2		Group 3			
008000	Component Cooling Water System	2.4.49	: Ability to perform without reference to procedures those actions that require immediate operatio system components and controls.	4.0	41.10 / 43.2 / 45.6
041000	Steam Dump System and Turbine Bypass Control	2.4.49	: Ability to perform without reference to procedures those actions that require immediate operatio system components and controls.	4.0	41.10 / 43.2 / 45.6
041000	Steam Dump System and Turbine Bypass Control	K5.04	Knowledge of the operational implications of the following concepts as the apply to the SDS:: Bas plant cooldown rates	3.1	41.5 / 45.7
045000	Main Turbine Generator System	2.4.49	: Ability to perform without reference to procedures those actions that require immediate operatio system components and controls.	4.0	41.10 / 43.2 / 45.6

PWR SRO Written Examination Outline (Continued)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
Tier 3		Group 4			
000000	Generic Knowledges and Abilities	2.1.01	: Knowledge of conduct of operations requirements.	3.8	41.10 / 45.13
000000	Generic Knowledges and Abilities	2.1.10	: Knowledge of conditions and limitations in the facility license.	3.9	43.1 / 45.13
000000	Generic Knowledges and Abilities	2.1.25	: Ability to obtain and interpret station reference materials such as graphs, monographs, and table which contain performance data.	3.1	41.10 / 43.5 / 45.12
000000	Generic Knowledges and Abilities	2.1.33	: Ability to recognize indications for system operating parameters which are entry-level conditions technical specifications.	4.0	43.2 / 43.3 / 45.3
000000	Generic Knowledges and Abilities	2.2.07	: Knowledge of the process for conducting tests or experiments not described in the safety analy report.	3.2	43.3 / 45.13
000000	Generic Knowledges and Abilities	2.2.17	: Knowledge of the process for managing maintenance activities during power operations.	3.5	43.5 / 45.13
000000	Generic Knowledges and Abilities	2.2.22	: Knowledge of limiting conditions for operations and safety limits.	4.1	43.2 / 45.2
000000	Generic Knowledges and Abilities	2.2.23	: Ability to track limiting conditions for operations.	3.8	43.2 / 45.13
000000	Generic Knowledges and Abilities	2.2.24	: Ability to analyze the affect of maintenance activities on LCO status.	3.8	43.2 / 45.13
000000	Generic Knowledges and Abilities	2.2.32	: Knowledge of the effects of alterations on core configuration.	3.3	43.6
000000	Generic Knowledges and Abilities	2.3.02	: Knowledge of facility ALARA program.	2.9	41.12 / 43.4 / 45.9 / 45.10

PWR SRO Written Examination Outline (Last Page)

System/Mode	System Title	KA Number	Title	SRO Value	10 CFR 55
000000	Generic Knowledges and Abilities	2.3.03	: Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g., disposal and handling systems).	2.9	43.4 / 45.10
000000	Generic Knowledges and Abilities	2.4.08	: Knowledge of how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom-based EOPs.	3.7	41.10 / 43.5 / 45.13
000000	Generic Knowledges and Abilities	2.4.09	: Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitig strategies.	3.9	41.10 / 43.5 / 45.13
000000	Generic Knowledges and Abilities	2.4.10	: Knowledge of annunciator response procedures.	3.1	41.10 / 43.5 / 45.13
000000	Generic Knowledges and Abilities	2.4.16	: Knowledge of EOP implementation hierarchy and coordination with other support procedures.	4.0	41.10 / 43.5 / 45.13
000000	Generic Knowledges and Abilities	2.4.37	: Knowledge of the lines of authority during an emergency.	3.5	45.13

Facility: Fort Calhoun Date of Examination: 6/25/01

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	Plant Parameter Verification	JPM: Calculate Shutdown Margin
	Interpret station reference materials : graphs	JPM: Determine maximum generator loading with low hydrogen pressure
A.2	Maintenance	JPM: Logging inoperability of structures, systems and components covered by the Maintenance Rule.
A.3	Radiation Control	JPM: RCA entry and exit
A.4	Emergency Plan	JPM: Escort Duties during declaration of an emergency event.

Facility: Fort Calhoun		Date of Examination: 6/25/01
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	Plant Parameter Verification	JPM: Determination of primary to secondary leakage using plant data.
	Mode Changes	JPM: Determine equipment operability requirements during mode transition.
A.2	Surveillance Testing	JPM: SRO Review of surveillance test results
A.3	Radiation Control	JPM: RCA entry and exit with inoperable PCMs
A.4	Emergency Plan	JPM: Classification and Protective Action Recommendations for Scenario Event.

Facility: Fort Calhoun Date of Examination: 6/25/01
Exam Level (circle one): **RO** / SRO(I) / SRO(U) Operating Test No.: _____

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a.Plant fire onsite / Restore control room ventilation following smoke alarm. (APE067 AA1.05/ Ability to operate control room ventilation following fire/RO 3.0/SRO 3.1)	N, A	9
b.Hydrogen purge control system / 156 - Operate Containment Hydrogen analyzer (028 A1.01/Ability to monitor changes in hydrogen concentration/RO 3.4/SRO 3.8)	E, D, S	5
c.Emergency Core Cooling System/ HPSI pump operability test.(006 A4.01/Ability to operate pumps/RO 4.1/SRO 3.9)	N, A, S	2
d.Pressurizer Pressure Control System/ PORV Operability Test (010 A4.03/ Ability to operate and monitor PORV and Block Valves./ RO 3.8/ SRO 4.0)	M, S,	3
e.RCPs/ 612 Start a reactor coolant pump (003 A2.01/Ability to mitigate problems with RCP seals/ RO 3.5/ SRO 3.9)	M, A, L, S	4
f.NIS/ 571 Adjust Narrow Range Safety Channel Nuclear Instrumentation(015 A1.01/Ability to monitor NIS calibration by heat balance/ RO 3.5 /SRO 3.8)	D, S	7
g.ED/G 392 Perform ESF Sequencer surveillance test (064 A3.07/ Ability to monitor automatic load sequencing / RO 3.6 / SRO 3.7)	M, A, S	6
B.2 Facility Walk-Through		
a. D.C. Distribution / 304 - Minimize DC Bus loads (063 A1.01/ Ability to predict battery capacity as affected by discharge rate/ RO 2.5 / SRO 3.3) Note: IPE indicates high importance at FCS.	E,T, D	6
b.Component Cooling /010RW-1 Establish Raw water backup to Containment coolers (008 K1.01/ knowledge of physical connections to RWS/ RO 3.1/ SRO 3.1)	R, E, D	8
c.Auxiliary Feedwater/ 101-Local start of FW-54 for makeup to EFWST.(061 K4.01 Knowledge of design features for water sources / RO 4.1 / SRO 4.2)	M	4

* 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, (E)mergency, (T)ime Critical

Facility: Fort Calhoun Date of Examination: 6/25/01
Exam Level (circle one): RO / **SRO(I)** / SRO(U) Operating Test No.: _____

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a.Plant fire onsite / Restore control room ventilation following smoke alarm. (APE067 AA1.05/ Ability to operate control room ventilation following fire/RO 3.0/SRO 3.1)	N, A	~~9~~ 3
b. Waste Gas Disposal System/ 027 Waste Gas Incident. (071 A3.03/Ability to monitor radiation alarms/ RO 3.6 SRO 3.8)	E, D, S	9
c.Emergency Core Cooling System/ HPSI pump operability test.(006 A4.01/Ability to operate pumps/RO 4.1/SRO 3.9)	N, A, S	2
d.Pressurizer Pressure Control System/ PORV Operability Test (010 A4.03/ Ability to operate and monitor PORV and Block Valves./ RO 3.8/ SRO 4.0)	M, S	3
e.RCPs/ 612 Start a reactor coolant pump (003 A2.01/Ability to mitigate problems with RCP seals/ RO 3.5/ SRO 3.9)	M, A, L, S	4
f.NIS/ 571 Adjust Narrow Range Safety Channel Nuclear Instrumentation(015 A1.01/Ability to monitor NIS calibration by heat balance/ RO 3.5 /SRO 3.8)	D, S	7
g.ED/G 392 Perform ESF Sequencer surveillance test (064 A3.07/ Ability to monitor automatic load sequencing / RO 3.6 / SRO 3.7)	M, A, S	6
B.2 Facility Walk-Through		
a. D.C. Distribution / 304 - Minimize DC Bus loads (063 A1.01/ Ability to predict battery capacity as affected by discharge rate/ RO 2.5 / SRO 3.3) Note: IPE indicates high importance at FCS.	E,T, D	6
b.Component Cooling /010RW-1 Establish Raw water backup to Containment coolers (008 K1.01/ knowledge of physical connections to RWS/ RO 3.1/ SRO 3.1)	R, E, D	8
c.Fire Protection / 0450 Emergency Start of the Diesel Fire Pump. (086 A4.01/ Ability to manually operate pumps/ RO 3.3/SRO 3.3)	D RO B.2.c.	~~8~~ 4

* 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, (E)mergency, (T)ime Critical

Facility: Fort Calhoun	Date of Examination: 6/25/01
Exam Level (circle one): RO / SRO(I) / **SRO(U)**	Operating Test No.: _____

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a.		
b. Waste Gas Disposal System/ 027 Waste Gas Incident. (071 A3.03/Ability to monitor radiation alarms/ RO 3.6 SRO 3.8)	E, D, S	9
c.Emergency Core Cooling System/ HPSI pump operability test.(006 A4.01/Ability to operate pumps/RO 4.1/SRO 3.9)	N, A, S	2
d.		
e.RCPs/ 612 Start a reactor coolant pump (003 A2.01/Ability to mitigate problems with RCP seals/ RO 3.5/ SRO 3.9)	M, A, L, S	4
f.		
g.		

B.2 Facility Walk-Through

a. D.C. Distribution / 304 - Minimize DC Bus loads (063 A1.01/ Ability to predict battery capacity as affected by discharge rate/ RO 2.5 / SRO 3.3) Note: IPE indicates high importance at FCS.	E,T, D	6
b.Component Cooling /010RW-1 Establish Raw water backup to Containment coolers (008 K1.01/ knowledge of physical connections to RWS/ RO 3.1/ SRO 3.1)	R, E, D	8
c.		

* 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, (E)mergency, (T)ime Critical

Facility: Fort Calhoun Scenario No.: 1 Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: Evaluate crew response to a dropped rod requiring a power reduction complicated by loss of the normal (for this evolution) boration path and manual S/G level control. Evaluate crew response to an excessive steam demand event following an inadvertent SGIS.

Initial Conditions: 100% power. D/G-2 tagged out of service

Turnover: Raw Water pumps should be rotated for maintenance.

Event No.	Malf. No.	Event Type*	Event Description
1		N(RO)	Rotate running Raw Water pumps
2		I(BOP)	S/G steam flow transmitter fails - manual feedwater level control required
3		I(RO)	Cold leg temperature transmitter fails low
4		C(ALL)	dropped control rod
5		R/N (ALL)	required power reduction to 70%
6		C(RO)	HCV-218-3 will not open (must use alternate boration path)
7		I(RO)	PIC-210 transmitter (letdown backpressure) fails high
8		C (ALL)	Inadvertent Steam Generator Isolation Signal
9		M(ALL)	S/G safety valve fails open following SGIS

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

Facility: Fort Calhoun Scenario No.: 2 Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: Evaluate crew's response to interfacing system LOCA (IPE risk significant event) requiring reactor trip, isolation of cooling water to RCP's, natural circulation and loss of CCW.

Initial Conditions: Plant at 80% power due to inoperability of ERF computer. FW-10 tagged OOS, RCS Activity high due to leaking fuel.

Turnover: Place second charging pump in operation for RCS activity control.

Event No.	Malf. No.	Event Type*	Event Description
1		N(RO)	Place second charging pump in operation
2		I(BOP)	PIC-910 fails high causing turbine bypass valve to open
3		C(RO)	Discharge to suction relief valve on charging pump that was just started - fails open causing loss of charging flow
4		I(RO)	Power Range NI Channel "C" fails (loss of voltage)
5		I(RO)	Controlling Pressurizer Pressure channel fails high
6		C(BOP)	Running TPCW pump trips - must manually start other pump
7		I(RO)	Power Range NI Channel "B" fails (loss of voltage)
8		R(RO), N(BOP)	Required power reduction to 70% power
9		M(ALL)	RCP seal cooler leak - Interfacing LOCA to CCW.
10		C(ALL)	CCW surge tank ruptures - Loss of CCW

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

Facility: Fort Calhoun Scenario No.: 3 Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: Evaluate crew response to emergency shutdown required by S/G tube leakage complicated by instrument failures. Evaluate response to a PORV LOCA with power available to only one bus.

Initial Conditions: 100% reactor power, D/G 2 tagged out of service

Turnover: Place an additional CCW/RW heat exchanger in service

Event No.	Malf. No.	Event Type*	Event Description
1		N(RO)	Place additional RW/CCW heat exchanger in service
2		I(RO)	Letdown HX CCW outlet temperature fails low
3		C(ALL)	Steam Generator Tube leak - RC2B
4		R(RO) N(BOP)	AOP-5 Emergency shutdown
5		I(RO)	Controlling pressurizer level channel fails low
6		I(BOP)	Instrument Air pressure transmitter fails low
7		M(All)	Loss of Offsite Power
8		C/M (ALL)	PORV Fails Open on trip - No power to block valve
9		C(RO)	PPLS fails to actuate

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

Facility: Fort Calhoun Scenario No.: 4 (Spare) Op-Test No.: _____

Examiners: _____ Operators: _____
_____ _____
_____ _____

Objectives: Evaluate crew response to various instrument failures followed by a sequence of events leading to a total loss of feedwater. Operator action designated as risk-significant in the IPE is required in this scenario.

Initial Conditions: (50%) reactor power, FW-10 OOS. A Group "A" rod dropped. Charging and letdown have been isolated for repair on letdown line.

Turnover: Letdown line repair is complete. A blown fuse was replaced on supply to clutch. Reestablish normal charging and letdown flow. Then, recover dropped rod.

Event No.	Malf. No.	Event Type*	Event Description
1		N(RO)	Establish normal charging and letdown.
2		R(RO)	Recover dropped rod
3		I(RO)	Loss of source/wide range NI channel "D"
4		I(RO)	VCT level fails low causing charging pump suction to realign to SIRWT
5		I(BOP)	Steam Generator level transmitter fails high
6		M(ALL)	Loss of Offsite Power
7		C(RO)	Raw water pump AC-10A breaker fails to open.
8		C(BOP)	FW-54 fails to start (Total loss of feedwater)

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

OPERATING TEST NO.: 1 (scenario 1 as PRI, 2 as BOP, both as SRO)

Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1	2	3	4
RO	Reactivity	1	5			
	Normal	1	1	8		
	Instrument	2	3,7	2		
	Component	2	4,6,8	6,10		
	Major	1	9	9		
As RO	Reactivity	1				
	Normal	0				
	Instrument	1				
	Component	1				
	Major	1				
SRO-I						
As SRO	Reactivity	0				
	Normal	1				
	Instrument	1				
	Component	1				
	Major	1				
SRO-U	Reactivity	0				
	Normal	1	1,5	1,8		
	Instrument	1	2,3,7	2,4,5,7		
	Component	1	4,6,8	3,6,10		
	Major	1	9	9		

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.

Author:

Chief Examiner:

OPERATING TEST NO.: 2 (scenario 2 as PRI, 1 as BOP)

Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1	2	3	4
RO	Reactivity	1		8		
	Normal	1	5	1		
	Instrument	2	2	4,5,7		
	Component	2	2	3,10		
	Major	1	9	9		
As RO	Reactivity	1				
	Normal	0				
	Instrument	1				
	Component	1				
	Major	1				
SRO-I						
As SRO	Reactivity	0				
	Normal	1				
	Instrument	1				
	Component	1				
	Major	1				
SRO-U	Reactivity	0				
	Normal	1				
	Instrument	1				
	Component	1				
	Major	1				

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.

Author: _____

Chief Examiner: _____

OPERATING TEST NO.: 3 (scenario 1 as SRO, 2 as PRI, 3 as BOP)

Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1	2	3	4
RO	Reactivity	1				
	Normal	1				
	Instrument	2				
	Component	2				
	Major	1				
As RO	Reactivity	1		8		
	Normal	0		1	4	
	Instrument	1		4,5,7	6	
	Component	1		3,10	3	
	Major	1		9	8	
SRO-I						
As SRO	Reactivity	0				
	Normal	1	1,5			
	Instrument	1	2,3,7			
	Component	1	4,6,8			
	Major	1	9			
SRO-U	Reactivity	0				
	Normal	1				
	Instrument	1				
	Component	1				
	Major	1				

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.

Author: _____

Chief Examiner: _____

OPERATING TEST NO.: 4 (scenario 1 as BOP, 2 as SRO , 3 as PRI)

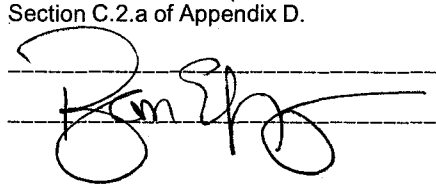
Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1	2	3	4
RO	Reactivity	1				
	Normal	1				
	Instrument	2				
	Component	2				
	Major	1				
As RO	Reactivity	1			4	
	Normal	0	5		1	
	Instrument	1	2		2,5	
	Component	1	4,8		3,9	
	Major	1	9		8	
SRO-I						
As SRO	Reactivity	0				
	Normal	1		1,8		
	Instrument	1		2,4,5,7		
	Component	1		3,6,10		
	Major	1		9		
SRO-U	Reactivity	0				
	Normal	1				
	Instrument	1				
	Component	1				
	Major	1				

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.

Author:

Chief Examiner:



OPERATING TEST NO.: 5 (scenario 1 as PRI, 2 as BOP , 3 as SRO)

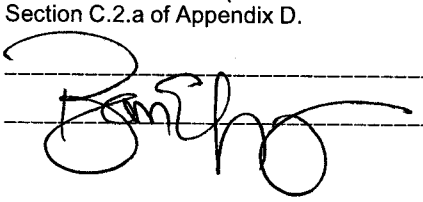
Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1	2	3	4
RO	Reactivity	1				
	Normal	1				
	Instrument	2				
	Component	2				
	Major	1				
As RO	Reactivity	1	5			
	Normal	0	1	8		
	Instrument	1	3,7	2		
	Component	1	4,6,8	6,10		
	Major	1	9	9		
SRO-I						
As SRO	Reactivity	0				
	Normal	1			1,4	
	Instrument	1			2,5,6	
	Component	1			3,9	
	Major	1			8	
SRO-U	Reactivity	0				
	Normal	1				
	Instrument	1				
	Component	1				
	Major	1				

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.

Author: _____

Chief Examiner: _____



Competencies	RO #1 and RO #3 SCENARIO				RO #2 and RO #4 SCENARIO				USRO #1 SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4
Understand and Interpret Annunciators and Alarms	3, 4 7	6			2, 8	3 4			3,4 7	3, 4 9		
Diagnose Events and Conditions	3, 4 6	2			2, 9	5 9			3,4 6	2, 9 10		
Understand Plant and System Response	4, 7 9	2, 6			2, 9	5 9			4,7 9	2, 9 10		
Comply With and Use Procedures (1)	3, 4 9	8 9			4, 5	8 10			3,4 ,9	4, 7 9		
Operate Control Boards (2)	5, 6 7	2 8			2 9	1 5						
Communicate and Interact With the Crew	3, 5 9	2 8			2 9	3 9			3,5 9	8 10		
Demonstrate Supervisory Ability (3)									4,5 9	9 10		
Comply With and Use Tech. Specs. (3)									3,4	4 7		

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: _____

Chief Examiner: _____

Competencies	ISRO(1) SCENARIO				ISRO(2) SCENARIO				ISRO(3) SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4
Understand and Interpret Annunciators and Alarms	3, 4 7	3 4	3 6		2 8	3,4 9	5 8		3,4 7	6	3, 7 8	
Diagnose Events and Conditions	3, 4 6	5 9	3 7		2 9	2,9 10	3 8		3,4 6	2	3 7	
Understand Plant and System Response	4, 7 9	5 9	3 4		2 9	2,9 10	3 4		4,7 9	2 6	3, 4 8	
Comply With and Use Procedures (1)	3, 4 9	8 10	4 8		4 5	4,7 9	4 8		3,4 9	8 9	3, 4 8	
Operate Control Boards (2)		1 5	4 7		2 9		1 5		5,6 7	2 8		
Communicate and Interact With the Crew	3, 5 9	3 9	3 7		2 9	8 10	3 4		3,5 9	2 8	3, 4 8	
Demonstrate Supervisory Ability (3)	4, 5 9					9 10					4 8	
Comply With and Use Tech. Specs. (3)	3, 4					4 7					3	

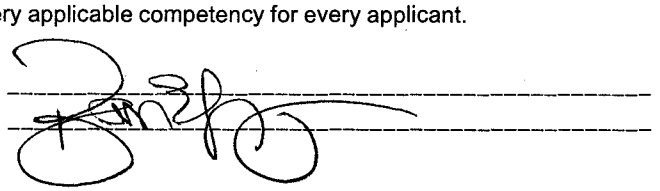
Notes:

(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:
Chief Examiner:



Comments on FCS 6/2001 Initial Exam Draft Outlines [FCS response in red]

Written Exam Outlines

- Written Exam Outline for Ros appears appropriate. [No Changes Needed]

- Written Exam Outline for SROs appears ok except for sampling from the 55.43 area. 55.43 states that the written examination for a senior operator ... will include a representative sample from among the following seven items... The draft outlines submitted only sample in 4 of the 7 areas. The outline should be changed to incorporate some additional sample areas in 55.43. [Two administrative KA items were replaced with items associated with these 55.43 topics for the SRO exam, 2.1.10 (55.43(b)(1) and 2.2.32 (55.43(b)(6)]

Job Performance Measures

I am assuming that the B.1 grouping of JPMs are conducted in the simulator. The Type Codes do not indicate this. Nor do the JPMs listed in B.2 [All B.1 JPMs except for B.1(a) should have the "S" code for simulator. These have been added.]

Need to verify that JPM "Transfer PZR Pressure Control from Manual to Auto" is not just a repeat of actions taken in Scenario 2, Event 5. [JPM was replaced]

Also, all the SRO JPMs are identical to the RO. What differentiate between the two. Suggest a couple JPMs for the SROs that are different. [Two of the SRO JPMs have been replaced with unique JPMs]

Scenarios

Need to submit 301-5 and 301-6 with draft operating exams. [Unsigned forms are now included.. Signed forms will be included with draft exam]

At least one (1) scenario should either have a "loss of SPDS" malfunction or in the initial conditions have it OOS. This forces the crew to use alternative indications. [Scenario two has been modified to have the ERF computer OOS as an initial condition.]

All Scenarios—Ensure TS actions incorporated for the SROs such as taking actions to Bypass a failed Channel. [These SRO actions are detailed in the ES-D-2 forms which are not part of the outline]

Scenario 2 has an ATWS (3 rods stuck out and emergency boration as the reactivity manipulation. Need to change this such that a larger ATWS is seen and the reactivity change by emergency boration is greater and makes an actual power reduction. Or change the malfunction to something else. [The initial power level for scenario 2 was changed to 80% power (consistent with a long term loss of ERF computer) and the 3 stuck rod failure was replaced by a second NI channel failure to have a tech spec required power reduction to 70% power for the reactivity manipulation.]

Spare Scenario has a reactivity manipulation as "realignment of a rod with a group". This would be alright if this was a recovery of a dropped rod. The reactivity change needs to be greater. [This was changed to recovery of a dropped rod]

SRO actions look buried in the outlines, such as TS actions. DO the SROs have involvement in all malfunctions? [Yes, SRO's have involvement in all malfunctions These SRO actions are detailed in the ES-D-2 forms which are not part of the outline]

Admin

RP area same for SRO and RO. Suggest make different for SRO with great difficulty. [The SRO RP administrative JPM was changed to RCA enter and exit with inoperable PCMs]