

Final Submittal

(Blue Paper)

SEQUOYAH APRIL/MAY 2007 EXAM

**EXAM NOS. 05000327/2007301
AND 05000328/2007301**

**APRIL 9 - 11, 2007 AND
MAY 9, 2007 (written)**

FINAL SAMPLE PLANS / OUTLINES

ES-301

Control Room/In-Plant Systems Outline
Rev Final

Form ES-301-2

Facility:	Sequoyah 1 & 2	Date of Examination:	4/07
Exam Level (circle one):	RO / SRO(I) / SRO (U)	Operating Test No.:	NRC
Control Room Systems® (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)			
System / JPM Title		Type Code*	Safety Function
a.	001 Rod Control Withdraw rods to raise power – Block SR High Flux Trips	S, N, A, L	1
b.	064 Emergency Diesel Generator Load Test 1B-B EDG – Low Oil Pressure (ESF) (JPM 077 2AP)	D, A, S	6
c.	072 Area Radiation Monitoring Respond to High Radiation – Control Room Isolation (JPM 153)	D, S	7
d.	006 ECCS Transfer to Hot Leg Recirc (JPM 013 AP1)	D, A, S	2
e.	007 PRT Return PRT Condition to Normal (JPM 036)	D, S	5
f.	076 Service Water Respond to ERCW Pump Trip (JPM 115 2AP)	D, A, S	4S
g.	010 PZR Pressure Control Respond to a stuck open spray valve in ES-0.1	N, A, S	3
In-Plant Systems® (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
i.	004 CVCS Local Control of Charging flow (JPM 80)	D, R	2
j.	078 Instrument Air Respond to Loss of Control Air system (JPM 96)	D, E	8
k.	035 Steam Generator Control SG PORVs from Aux Control Room (JPM 66)	D, E	4S
@	All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
* Type Codes		Criteria for RO / SRO-I / SRO-U	

03/30/2007

FINAL- OP TEST ONLY

ES-301

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(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≤ 1 / ≤ 1 / ≤ 1
(L)ow-Power / Shutdown	≤ 1 / ≤ 1 / ≤ 1
(N)ew or (M)odified from bank including 1(A)	≤ 2 / ≤ 2 / ≤ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≤ 1 / ≤ 1 / ≤ 1
(S)imulator	

JPM Summary

- JPM A Reactor Startup, critical at a power just prior to SR Trip block. Applicant will withdraw rods to get a stable SUR at some value <0.5 DPM and block SR Trips when required. On second rod withdrawal, a continuous rod withdrawal will result, requiring the reactor to be tripped (Rods cannot be stopped in any mode). New JPM requiring process control. Also performed by SRO Upgrade applicants as a low power JPM.
- JPM B During a DG load test, a low oil pressure will become apparent, and the DG must be tripped. Bank JPM. Also performed by SRO upgrade applicants as an ESF system.
- JPM C A high radiation alarm will require action to initiate control room isolation. Bank JPM. Also performed by SRO Upgrade applicants.
- JPM D During transfer to Hot Leg Recirculation, a valve failure will require the applicant to perform alternate valve alignment to establish recirculation. PSA significant action; Bank JPM
- JPM E Return PRT conditions to normal after a PORV lifts. Bank JPM
- JPM F ERCW Pump trip response; valve failure requires alternate action. Bank JPM
- JPM G Post-trip plant response, applicant will be required to determine that a spray valve is failed open. After attempting to close the valve, applicants must trip RCPs and energize heaters. New JPM requiring process control.
- JPM I Plant JPM performed in RCA; also performed by SRO Upgrade applicants. Bank JPM
- JPM J Plant JPM performed by all applicants including SRO Upgrades. Emergency/Abnormal task; Bank JPM
- JPM K Plant JPM; Emergency/Abnormal task; Bank JPM

ES-301

Administrative Topics Outline
Rev Final

Form ES-301-1

Facility: Sequoyah 1 & 2		Date of Examination: 4/9/07	
Examination Level (circle one): SRO		Operating Test Number: NRC	
Administrative Topic (see Note)	Type Code*	Describe activity to be performed	
Conduct of Operations	N, R	2.1.4 (3.4)	Knowledge of shift staffing requirements
		JPM:	Determine overtime requirements
Conduct of Operations	N, S	2.1.25 (3.1)	Ability to obtain and interpret station reference materials such as graphs, nomographs, and tables which contain performance data
		JPM:	Determine Main Turbine loading and acceleration rate
Equipment Control	N, R	2.2.21 (3.5)	Knowledge of Pre and Post Maintenance Operability Requirements
		JPM:	Evaluate Equipment operability for mode change following a Post Maintenance Test
Radiation Control	N, R	2.3.2 (2.9)	Knowledge of facility ALARA program
		JPM:	Determine Stay Time
Emergency Plan	N, R	2.4.41 (4.1)	Knowledge of Emergency Action Level thresholds and classifications
		JPM:	Evaluate change in conditions for Emergency Classification upgrade
NOTE: All items (5 total are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.			
*Type Codes & Criteria: (C)ontrol room Class(R)oom (D)irect from bank (≤ 3 for ROs; $\leq$ for SROs & RO retakes) (N)ew or (M)odified from bank (> 1) (P)revious 2 exams (≤ 1; randomly selected) (S)imulator			

SRO Admin JPM Summary

- A1a Applicant will determine whether a call-in violates overtime requirements, and will complete the documentation for exceeding overtime limits. This is a new JPM
- A1b The applicant will determine Main Turbine loading and acceleration rate using Turbine temperature information available in the simulator, curves available in plant procedures, and calculations. This is a new JPM.
- A2 Applying TS 3.0.4, applicant will determine whether a mode change from Mode 5 to Mode 4 may be made based on information available about TS required equipment. (Containment Spray) This is a new JPM.
- A3 Given a task to perform in the RCA, an RWP, survey maps, and an alarming dosimeter, the applicant will be required to determine maximum stay time prior to receiving a dosimeter alarm. This is a new JPM.
- A4 Given a situation in the E-Plan, evaluate additional conditions to determine if a classification upgrade is required. (Upgrade from an NOUE to a SAE) This is a new JPM.

ES-401

PWR Examination Outline

Form ES-401-2

Facility:		Sequoyah NRC												Date of Exam:		4/2007							
Tier	Group	RO K/A Category Points												SRO-Only Points									
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total							
1. Emergency & Abnormal Plant Evolutions	1	1	0	7				3	1				6	18	3	3	6						
	2	2	2	1				2	2				0	9	2	2	4						
	Tier Totals	3	2	8				5	3				6	27	5	5	10						
2. Plant Systems	1	5	2	3	3	1	1	3	4	2	2	2	28	2	3	5							
	2	1	1	1	0	1	1	0	1	1	2	1	10	0	2	3							
	Tier Totals	6	3	4	3	2	2	3	5	3	4	3	38	4	4	8							
3. Generic Knowledge and Abilities Categories				1		2		3		4		10		1		2		3		4		7	
				3		3		2		2				2		2		1		2			
Note:	1.	Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).																					
	2.	The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.																					
	3.	Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding elimination of inappropriate K/A statements.																					
	4.	Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.																					
	5.	Absent a plant specific priority, only those KAs having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.																					
	6.	Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.																					
	7.*	The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.																					
	8.	On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above. Use duplicate pages for RO and SRO-only exams.																					
	9.	For Tier 3, select topics from Section 2 of the K/A Catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10CFR55.43																					

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
007 / Reactor Trip / 1						X	EA2.06	Ability to determine or interpret the following as they apply to a reactor trip: Occurrence of a reactor trip	4.5	76
008 / Pressurizer Vapor Space Accident / 3	X						2.4.4	Emergency Procedures / Plan Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	77
011 / Large Break LOCA / 3						X	EA2.10	Ability to determine or interpret the following as they apply to a Large Break LOCA: Verification of adequate core cooling	4.7	78
026 / Loss of Component Cooling Water / 5	X						2.2.25	Equipment Control: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	79
027 / Pressurizer Pressure Control System Malfunction / 3	X						2.4.49	Emergency Procedures / Plan Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	80
058 / Loss of DC Power / 5						X	AA2.02	Ability to determine and interpret the following as they apply to the Loss of DC Power: 125V dc bus voltage low/high/low, alarm	3.6	81
007 / Reactor Trip / 1					X		EA1.08	Ability to operate and monitor the following as they apply to a reactor trip: AFW System	4.4	39
011 / Large Break LOCA / 3				X			EK3.14	Knowledge of the reasons for the following responses as they apply to the Large Break LOCA: RCP tripping requirement	4.1	40
015 / 17 / Reactor Coolant Pump Malfunctions / 4						X	AA2.10	Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): When to secure RCPs on loss of cooling or seal injection	3.7	41
022 / Loss of Reactor Coolant Makeup / 2				X			AK3.03	Knowledge of the reasons for the following responses as they apply to the Loss of Reactor Coolant Pump Makeup: Performance of lineup to establish excess letdown after determining need	3.1	42
025 / Loss of Residual Heat Removal System / 4		X					AK1.01	Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: Loss of RHRS during all modes of operation	3.9	43
026 / Loss of Component Cooling Water / 5	X						2.4.6	Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.	3.1	44

Sequoyah NRC
Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

Form ES-101-2

MAY-07-2006 15:24

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E/A/E # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
027 / Pressurizer Pressure Control System Malfunction / 3	X						2.4.6	Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.	3.1	45
029 / Anticipated Transient Without Scram (ATWS) / 1	X						2.2.25	Equipment Control Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	2.5	46
038 / Steam Generator Tube Rupture / 3				X			EK3.06	Knowledge of the reasons for the following responses as they apply to the SGTR: Actions contained in EOP for RCS water inventory balance, S/G tube rupture, and plant shutdown procedures	4.2	47
055 / Station Blackout / 6				X			EK3.01	Knowledge of the reasons for the following responses as they apply to the Station Blackout: Length of time for which battery capacity is designed	2.7	48
056 / Loss of Off-site Power / 6	X						2.4.31	Emergency Procedures / Plan Knowledge of annunciators alarms and indications, and use of the response instructions.	3.3	49
057 / Loss of Vital AC Electrical Instrument Bus / 6				X			AK3.01	Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus: Actions contained in EOP for loss of vital ac electrical instrument bus	4.1	50
058 / Loss of DC Power / 6					X		AA1.01	Ability to operate and / or monitor the following as they apply to the Loss of DC Power: Cross-tie of the affected dc bus with the alternate supply	3.4	51
062 / Loss of Nuclear Service Water / 4				X			AK3.01	Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: The conditions that will initiate the automatic opening and closing of the SWS isolation valves to the nuclear service water coolers	3.2	52
E04 / LOCA Outside Containment / 3	X						2.1.28	Conduct of Operations: Knowledge of the purpose and function of major system components and controls.	3.2	53
E05 / Loss of Secondary Heat Sink / 4					X		EA1.3	Ability to operate and monitor the following as they apply to the (Loss of Secondary Heat Sink) Desired operating results during abnormal and emergency situations.	3.8	54
E11 / Loss of Emergency Coolant Recirculation / 4				X			EK3.2	Knowledge of the reasons for the following responses as they apply to the (Loss of Emergency Coolant Recirculation) Normal, abnormal and emergency operating procedures associated with (Loss of Emergency Coolant Recirculation).	3.5	55

ES-401

Form ES-31-2

Sequoyah NRC
Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
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E12 / Uncontrolled Depressurization of all Steam Generators / 4	X						2.4.31	Emergency Procedures / Plan Knowledge of annunciators alarms and indications, and use of the response instructions.	3.3	56
K/A Category Point Totals:	9	1	0	7	3	4	Group Point Total:			18/6

NUREG-1021

Sequoyah NRC
Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

Form ES-01-2

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P.07

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
068 / Control Room Evacuation / 8						X	AA2.02	Ability to determine and interpret the following as they apply to the Control Room Evacuation: Local toxic acid flow	4.2	82
E07 / Saturated Core Cooling / 4						X	EA2.1	Ability to determine and interpret the following as they apply to the (Saturated Core Cooling) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	4.0	83
E09 / Natural Circulation Operations / 4	X						2.2.22	Equipment Control Knowledge of limiting conditions for operations and safety limits.	4.1	84
E15 / Containment Flooding / 5	X						2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.8	85
001 / Continuous Rod Withdrawal / 1						X	AA2.04	Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal: Reactor power and its trend	4.2	57
005 / Inoperable/Stuck Control Rod / 1						X	AA2.02	Ability to determine and interpret the following as they apply to the Inoperable / Stuck Control Rod: Difference between jog and run rod speeds, effect on CRDM of stuck rod	2.5	58
028 / Pressurizer Level Control Malfunction / 2				X			AK3.05	Knowledge of the reasons for the following responses as they apply to the Pressurizer Level Control Malfunctions: Actions contained in EOP for PZR level malfunction	3.7	59
059 / Accidental Liquid RadWaste Release / 9		X					AK1.02	Knowledge of the operational implications of the following concepts as they apply to Accidental Liquid RadWaste Release: Biological effects on humans of various types of radiation, exposure levels that are acceptable for nuclear power plant personnel, and the units used for radiation-intensity measurements and for radiation exposure levels	2.6	60
060 / Accidental Gaseous RadWaste Release / 9		X					AK1.01	Knowledge of the operational implications of the following concepts as they apply to Accidental Gaseous RadWaste Release: Types of radiation, their units of intensity, and the location of sources of radiation in a nuclear power plant	2.5	61
068 / Control Room Evacuation / 8			X				AK2.02	Knowledge of the interrelations between the Control Room Evacuation and the following: Reactor trip system	3.7	62
074 / Inadequate Core Cooling / 4					X		EA1.08	Ability to operate and monitor the following as they apply to a Inadequate Core Cooling: HPI System	4.2	63

Sequoyah NRC
Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
E02 / SI Termination / 3					X		EA1.3	Ability to operate and / or monitor the following as they apply to the (SI Termination) Desired operating results during abnormal and emergency situations.	3.8	64
E13 / Steam Generator Overpressure / 4			X				EK2.1	Knowledge of the interrelations between the (Steam Generator Overpressure) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.0	65
K/A Category Point Total:	2	2	2	1	2	4	Group Point Total:			9/4

Sequoyah NRC
Written Examination Outline
Plant Systems – Tier 2 Group 1

Form ES-J1-2

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
007 Pressurizer Relief/Quench Tank	X											2.1.12	Conduct of Operations: Ability to apply technical specifications for a system	4.0	86
022 Containment Cooling									X			A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the CCG; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Fan motor thermal overload/high-speed operation	3.0	87
025 Ice Condenser									X			A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the ice condenser system: correct, control, or mitigate the consequences of those malfunctions or operations: Trip of glycol circulation pumps	2.7	88
039 Main and Reheat Steam	X											2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.8	89
078 Instrument Air	X											2.4.6	Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.	4.0	90
003 Reactor Coolant Pump					X							K4.04	Knowledge of RCPS design feature(s) and/or interlock(s) which provide for the following: Adequate cooling of RCP motor and seals	2.8	1
004 Chemical and Volume Control									X			A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Boundary isolation valve leak	3.6	2
005 Residual Heat Removal		X										K1.01	Knowledge of the physical connections and/or cause-effect relationships between the RHRS and the following systems: CCWS	3.2	3
005 Residual Heat Removal								X				A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RHRS controls including: Heatup/cooldown rates	3.5	4
006 Emergency Core Cooling				X								K3.01	Knowledge of the effect that a loss or malfunction of the ECCS will have on the following: RCS	4.1	5
006 Emergency Core Cooling										X		A3.01	Ability to monitor automatic operation of the ECCS, including: Accumulators	4.0	6
007 Pressurizer Relief/Quench Tank		X										K1.03	Knowledge of the physical connections and/or cause-effect relationships between the PRTS and the following systems: RCS	3.0	7

Sequoyah NRC
Written Examination Outline
Plant Systems – Tier 2 Group 1

Form ES-401-2

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
008 Component Cooling Water											X	A4.09	Ability to manually operate and/or monitor in the control room: CCW temperature control valve	3.0	8
010 Pressurizer Pressure Control			X									K2.03	Knowledge of bus power supplies to the following: Indicator for PORV position	2.8	9
012 Reactor Protection			X									K2.01	Knowledge of bus power supplies to the following: RPS channels, components, and interconnections	3.3	10
012 Reactor Protection		X										K1.04	Knowledge of the physical connections and/or cause effect relationships between the RPS and the following systems: RPIS	3.2	11
013 Engineered Safety Features Actuation				X								K3.03	Knowledge of the effect that a loss or malfunction of the ESFAS will have on the following: Containment	4.3	12
022 Containment Cooling											X	A4.01	Ability to manually operate and/or monitor in the control room: CCS fans	3.6	13
025 Ice Condenser									X			A2.06	Ability to (a) predict the impacts of the following malfunctions or operations on the ice condenser system; correct, control, or mitigate the consequences of those malfunctions or operations: Decreasing ice condenser temperature	2.5	14
026 Containment Spray					X							K4.01	Knowledge of CSS design feature(s) and/or interlock(s) which provide for the following: Source of water for CSS, including recirculation phase after LOCA	4.2	15
039 Main and Reheat Steam										X		A3.02	Ability to monitor automatic operation of the MRSS, including: Isolation of the MRSS	3.1	16
039 Main and Reheat Steam									X			A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Malfunctioning steam dump	3.4	17
059 Main Feedwater								X				A1.07	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MFW controls including: Feed Pump speed, including normal control speed for ICS	2.5	18
061 Auxiliary/Emergency Feedwater							X					K6.02	Knowledge of the effect of a loss or malfunction of the following will have on the AFW components: Pumps	2.6	19
062 AC Electrical Distribution	X											2.1.10	Conduct of Operations: Knowledge of conditions and limitations in the facility license.	2.7	20

Sequoyah NRC
Written Examination Outline
Plant Systems – Tier 2 Group 1

Form ES-401-2

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
063 DC Electrical Distribution	X											2.2.22	Equipment Control Knowledge of limiting conditions for operations and safety limits.	3.4	21
064 Emergency Diesel Generator				X								K4.01	Knowledge of ED/G system design feature(s) and/or inter-lock(s) which provide for the following: Trips while loading the ED/G (frequency, voltage, speed)	3.8	22
073 Process Radiation Monitoring						X						K5.01	Knowledge of the operational implications as they apply to concepts as they apply to the PRM system: Radiation theory, including sources, types, units, and effects	2.5	23
073 Process Radiation Monitoring									X			A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system: and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Erratic or failed power supply	2.5	24
076 Service Water		X										K1.16	Knowledge of the physical connections and/or cause-effect relationships between the SWS and the following systems: ESF	3.6	25
078 Instrument Air		X										K1.04	Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: Cooling water to compressor	2.6	26
103 Containment								X				A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the containment system controls including: Containment pressure, temperature, and humidity	3.7	27
103 Containment				X								K3.03	Knowledge of the effect that a loss or malfunction of the containment system will have on the following: Loss of containment integrity under refueling operations.	3.7	28
K/A Category Point Totals:	5	5	2	3	3	1	1	3	6	2	2	Group Point Total:			28/5

Sequoyah NRC
Written Examination Outline
Plant Systems – Tier 2 Group 2

Form ES-401-2

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
001 Control Rod Drive									X			A2.12	Ability to (a) predict the impacts of the following malfunction or operations on the CRDS; and (b) based on those predictions, use procedures to correct control, or mitigate the consequences of those malfunctions or operations: Erroneous ECP calculation	4.2	91
041 Steam Dump/Turbine Bypass Control									X			A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the SDS; and (b) based on those predictions or mitigate the consequences of those malfunctions or operations: Loss of IAS	3.1	92
045 Main Turbine Generator	X											2.4.30	Emergency Procedures / Plan Knowledge of which events related to system operations/status should be reported to outside agencies.	3.6	93
001 Control Rod Drive			X									K2.03	Knowledge of bus power supplies to the following: One-line diagram of power supplies to logic circuits	2.7	29
015 Nuclear Instrumentation		X										K1.08	Knowledge of the physical connections and/or cause-effect relationships between the NIS and the following systems: RCS (pump start)	2.6	30
017 In-core Temperature Monitor											X	A4.02	Ability to manually operate and/or monitor in the control room: Temperature values used to determine RCS/RCP operation during inadequate core cooling (i.e., if applicable, average of five highest values)	3.8	31
028 Hydrogen Recombiner and Purge Control						X						K6.01	Knowledge of the effect of a loss or malfunction on the following will have on the HRPS: Hydrogen recombiners	2.6	32
029 Containment Purge											X	A4.01	Ability to manually operate and/or monitor in the control room: Containment purge flow rate	2.5	33
035 Steam Generator						X						K5.03	Knowledge of operational implications of the following concepts as they apply to the S/GS: Shrink and swell concept	2.8	34
071 Waste Gas Disposal				X								K3.04	Knowledge of the effect that a loss or malfunction of the Waste Gas Disposal System will have on the following: Ventilation system	2.7	35
034 Fuel Handling Equipment										X		A3.02	Ability to monitor automatic operation of the fuel handling system, including: Load limits	2.5	36
075 Circulating Water	X											2.1.23	Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	3.9	37

Form ES-01-2

Sequoyah NRC
Written Examination Outline
Plant Systems - Tier 2 Group 2

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
086 Fire Protection									X			A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the Fire Protection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Manual shutdown of the FPS	2.9	38
K/A Category Point Totals:	2	1	1	1	0	1	1	0	3	1	2	Group Point Total:			10/3

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ES-401

Generic Knowledge and Abilities Outline (Tier3)

Form ES-401-3

Facility:	Sequoyah NRC	Date of Exam:	4/2007			
Category	K/A #	Topic	RO		SRO-Only	
			IR	Q#	IR	Q#
1. Conduct of Operations	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.			4.4	94
	2.1.13	Knowledge of facility requirements for controlling vital / controlled access.			2.9	95
	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	3.0	66		
	2.1.18	Ability to make accurate, clear and concise logs, records, status boards, and reports.	2.9	67		
	2.1.21	Ability to obtain and verify controlled procedure copy.	3.1	68		
Subtotal				3		2
2. Equipment Control	2.2.5	Knowledge of the process for making changes in the facility as described in the safety analysis report.			2.7	96
	2.2.9	Knowledge of the process for determining if the proposed change, test or experiment increases the probability of occurrence or consequences of an accident during the change, test or experiment.			3.3	97
	2.2.12	Knowledge of surveillance procedures.	3.0	69		
	2.2.23	Ability to track limiting conditions for operations.	2.6	70		
	2.2.26	Knowledge of refueling administrative requirements.	2.5	71		
Subtotal				3		2
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.			3.1	98
	2.3.2	Knowledge of facility ALARA program.	2.5	72		
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9	73		
Subtotal				2		1
4. Emergency Procedures / Plan	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.			4.0	99
	2.4.30	Knowledge of which events related to system operations/status should be reported to outside agencies.			3.6	100

ES-401	Generic Knowledge and Abilities Outline (Tier3)	Form ES-401-3
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	2.4.25	Knowledge of fire protection procedures.	2.9	74		
	2.4.9	Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.	3.3	75		
	Subtotal			2		2
Tier 3 Point Total				10		7

