Draft Submittal

(Pink Paper)

SEQUOYAH APRIL/MAY 2007 EXAM

EXAM NOS. 05000327/2007301
AND 05000328/2007301

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

DRAFT Written Exam Quality Checklist (ES-401-6)

& Written Exam Sample Plan

03/12/2007

DRAFT-WRITTEN EXAM

ES-401 Written Examination Quality Checklist Form ES-401-6

Facility: Sequoyah	Date of Exam: 4/2007	Exam Level: RO/SRO

Item Description				Initial a	Initial b*	Initial c#	
1.	Questions and answers technically accurate and applicable to facility.			JBA	RHE	MB	*1
2.	a. NRC K/As referenced for all questions. b. Facility learning objectives referenced as available.			JBA	RHE	MB	
3.	SRO questions are appropriate in accordance with Section D.2.d of ES-401			JBA	RHE	MB	*2
4.	The sampling process was random and systematic. (If more than 4 RO and 2 SRO questions were repeated from the last 2 NRC licensing exams, consult the NRR OL Program Office)			RA	RHE	MB	
5.	Question duplication from the license screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate: _____ the audit exam was systematically and randomly developed, or _____ the audit exam was completed before the license exam was started, or _____ the examinations were developed independently, or XX the licensee certifies that there is no duplication, or ___ other (explain)			JBA	RHE	MB	
6.	Bank use meets limits (no more than 75 percent from the bank at least 10 percent new, and the rest new or modified); enter the actual RO / SRO-only question distribution(s) at right. *(in %)*	Bank: 48/28	Modified: 3/8	New: 49/64	JBA	RHE	MB	
7.	Between 50 and 60 percent of the question on the RO exam are written at the comprehension/ analysis level; the SRO exam may exceed 60 percent if the randomly selected K/As support the higher cognitive levels; enter the actual RO / SRO question distribution(s) at right	Memory: 58%/20% 48/12	C/A: 42%/80% 52/88	NRC→	RA	RHE	MB	*3
8.	References/handouts provided do not give away answers or aid in the elimination of distractors.				JBA	RHE	MB	
9.	Question content conforms with specific K/A statements in the previously approved examination outline and is appropriate for the tier to which they are assigned; deviations are justified.				JBA	RHE	MB	*4
10.	Question psychometric quality and format meet the guidelines in ES Appendix B.				RA	RHE	MB	
11.	The exam contains the required number of one-point, multiple choice items; the total is correct and agrees with value on cover sheet.				RA	RHE	MB	

		Printed Name / Signature	Date
a.	Author	Joseph G. Arsenault / Joseph G. Arsenault	3/8/2007
b.	Facility Reviewer (*)	Randolph H. Evans / RH Evans	3/12/07
c.	NRC Chief Examiner (#)	Mark A. Bates / Mark A. Bates	04/16/2007
d.	NRC Regional Supervisor	Robert Haag / Robert Haag	4/18/07

Note: * The facility reviewer's initials/signature are not applicable for NRC-developed examinations.
Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.

*1 Exceptions noted on 401-9.

*2 Exceptions noted on 401-9.

*3 NRC Review yields percentages outside acceptable limits. Items noted on 401-9.

*4 Exceptions noted on 401-9.

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	2	0	2	1	10	0 2	1	3
	Tier Totals	6	3	4	3	2	2	3	6	2	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

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Sequoyah 1 & 2
2007 NRC Initial License Written Examination
Written Examination Outline Methodology

The written examination outline was developed using a proprietary electronic random outline generator developed by Western Technical Services, Inc.

The software was designed to provide a written examination outline in accordance with the criteria contained in NUREG 1021, Revision 9.

The application was developed using Visual Basic code, relying on a true random function based on the PC system clock. The random generator selects topics in a Microsoft Access Database containing Revision 2 of the PWR K&A catalogue. The selected data is then written to a separate data table. The process for selection of topics is similar to the guidance in ES-401, Attachment 1.

The attached outline report and plant specific suppression profile (not required for Sequoyah; NO topics with importance values of 2.5 or greater were pre-suppressed) report are written directly from the data tables created by the software. Electronic copies of the data tables are on file.

The process used to develop the outlines is as follows:

- For Tier 1 and Tier 2 generic items, only the items required to be included in accordance with ES-401, Attachment 2 are included in the generation process.
- Outline is generated for all topics with KA importance ≥2.5.
- 25 SRO topics are randomly selected from Tier 1 AA2 and required generic items, Tier 2 A2 and required generic items, (including all System 034 topics) and Tier 3 generic items (All with ties to 10CFR55.43). 75 RO topics are randomly selected to complete the outline, 100 topics total.
- The exam report generated lists the topic (Question) number in the far right column. RO topics are numbered 1-75, and SRO topics are numbered 76–100. The SRO topics are written in red ink for ease of identification.
- Items that are rejected after the initial generation process are placed on the rejected items page. The software tracks which items are added, and a report of outline modification may be generated.
- Disposition of any item randomly selected but not included in the outline is documented and included.

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#
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 / 8	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 / 6						X	**AA2 02**	**Ability to determine and interpret the following as they apply to the Loss of DC Power: 125V dc bus voltage, low/critical 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			EK3.11	Knowledge of the reasons for the following responses as the apply to the Large Break LOCA:NC and PC	3.3	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

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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#
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 / 8	X						2.4.6	Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.	3.1	44
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 the 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 the 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	Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink) Desired operating results during abnormal and emergency situations.	3.8	54

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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#
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
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**

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#
068 / Control Room Evacuation / 8						X	**AA2.02**	**Ability to determine and interpret the following as they apply to the Control Room Evacuation: Local boric 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

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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#
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
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

Written Examination Outline
Plant Systems – Tier 2 Group 1

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											**2.1.9**	**Conduct of Operations: Ability to direct personnel activities inside the control room.**	**4.0**	**86**
022 Containment Cooling									X			**A2.03**	**Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: 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											**2.1.14**	**Conduct of Operations: Knowledge of system status criteria which require the notification of plant personnel.**	**3.3**	**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 (CCS @ SQN)	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

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Written Examination Outline
Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
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
008 Component Cooling Water											X	A4.03	Ability to manually operate and/or monitor in the control room: Throttling of the CCW pump discharge valve. (CCWS- CCS @ SQN)	2.7	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

Written Examination Outline
Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
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											2.1.14	Conduct of Operations: Knowledge of system status criteria which require the notification of plant personnel.	2.5	20
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

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Written Examination Outline
Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
K/A Category Point Totals:	5	5	2	3	3	1	1	3	6	2	2	Group Point Total:			**28/5**

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#
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 the 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

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#
072 Area Radiation Monitoring									X			A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the ARM system- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Erratic or failed power supply	2.7	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
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	4	0	2	Group Point Total:			**10/3**