

Facility:		SSES 2013 #1						Date of Exam:		08/20/12								
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 & Plant Evolutions	1	3	5	3				3	3			3	20	4		3		7
	2	1	2	1				1	1			1	7	2		1		3
	Tier Totals	4	7	4				4	4			4	27	6		4		10
2. Plant Systems	1	5	1	2	3	1	2	2	3	3	2	2	26	2		3		5
	2	1	1	1	1	1	1	2	1	1	1	1	12	0	1	2		3
	Tier Totals	6	2	3	4	2	3	4	4	4	3	3	38	3		5		8
3. Generic Knowledge & Abilities Categories					1		2		3		4		10	1	2	3	4	7
					2		3		2		3			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  $\pm 1$  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 section D.1.b of ES-401, 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. Refer to Section D.1.b of ES-401 for the applicable K/A's
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. If fuel handling equipment is sampled in other than Category A2 or G\* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). 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

SSES 2013 #1  
Written Examination Outline  
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295003 Partial or Total Loss of A.C. Pwr / 6					X		AA2.04 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : System lineups	3.7	76
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1					X		EA2.02 - Ability to determine and/or interpret the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN : Reactor water level	4.2	77
295031 Reactor Low Water Level / 2					X		EA2.04 - Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL: Adequate core cooling	4.8	78
295023 Refueling Accidents / 8						X	2.1.23 - Conduct of Operations: Ability to perform specific and integrated plant procedures	4.4	79
295028 High Drywell Temperature / 5						X	2.1.25 - Conduct of Operations: Ability to interpret reference materials such as graphs, curves, tables, etc.	4.2	80
295019 Partial or Total Loss of Inst. Air / 8						X	2.4.6 - Emergency Procedures / Plan: Knowledge of EOP mitigation strategies.	4.7	81
295025 High Reactor Pressure / 3					X		EA2.02 - Ability to determine and/or interpret the following as they applies to HIGH REACTOR PRESSURE: Reactor power	4.2	82
295030 Low Suppression Pool Water Level / 5	X						EK1.03 - Knowledge of the operational implications of the following concepts as they apply to LOW SUPPRESSION POOL WATER LEVEL: Heat capacity	3.8	39
295025 High Reactor Pressure / 3	X						EK1.01 - Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE : Pressure effects on reactor power	3.9	40
295006 SCRAM / 1	X						AK1.01 - Knowledge of the operational implications of the following concepts as they apply to SCRAM : Decay heat generation and removal	3.7	41
295019 Partial or Total Loss of Inst. Air / 8		X					AK2.03 - Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR and the following: Reactor feedwater	3.2	42
600000 Plant Fire On-site / 8		X					AK2.01 - Knowledge of the interrelations between PLANT FIRE ON SITE and the following: Sensors, detectors and valves	2.6	43
295018 Partial or Total Loss of CCW / 8		X					AK2.01 - Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER and the following: System loads	3.3	44
295016 Control Room Abandonment / 7			X				AK3.03 - Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT : Disabling control room controls	3.5	45

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EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4			X				AK3.01 - Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Reactor water level response	3.4	46
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown/ 1			X				EK3.06 - Knowledge of the reasons for the following responses as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN : Maintaining heat sinks external to the containment	3.8	47
295004 Partial or Total Loss of DC Pwr / 6				X			AA1.03 - Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : A.C. electrical distribution	3.4	48
295028 High Drywell Temperature / 5				X			EA1.04 - Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE : Drywell pressure	3.9	49
295026 Suppression Pool High Water Temp. / 5				X			EA1.03 - Ability to operate and/or monitor the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Temperature monitoring	3.9	50
295003 Partial or Complete Loss of AC / 6					X		AA2.04 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : System lineups	3.5	51
295021 Loss of Shutdown Cooling / 4					X		AA2.02 - Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING : RHR/shutdown cooling system flow	3.4	52
295038 High Off-site Release Rate / 9		X					EK2.09 - Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following:: Post accident sample system (PASS): Plant-Specific..	2.9	53
295024 High Drywell Pressure / 5						X	2.4.6 - Emergency Procedures / Plan: Knowledge of EOP mitigation strategies.	3.7	54
295005 Main Turbine Generator Trip / 3						X	2.2.22 – Equipment Control: Knowledge of limiting conditions for operations and safety limits.	4.0	55
700000 Generator Voltage and Electric Grid Disturbances						X	2.1.19 - Conduct of Operations: Ability to use plant computers to evaluate system or component status.	3.9	56
295023 Refueling Acc Cooling Mode / 8		X					AK2.04 - Knowledge of the interrelations between REFUELING ACCIDENTS and the following: RMCS/Rod control and information system	3.2	57
295031 Reactor Low Water Level / 2					X		EA2.01 - Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL : Reactor water level	4.6	58
K/A Category Totals:	3	5	3	3	3/4	3/3	Group Point Total:	20/7	

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

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295007 High Reactor Pressure / 3					X		AA2.01 - Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE : Reactor pressure	4.1	83
295035 Secondary Containment High Differential Pressure / 5						X	2.4.30 - Emergency Procedures / Plan; Knowledge of events related to system operation / status that must be reported to internal organizations or external agencies, such as the state, the NRC, or the transmission system operator.	4.1	84
295033 High Secondary Containment Area Radiation Levels / 9					X		EA2.01 - Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS : Area radiation levels	3.9	85
295034 Secondary Containment Ventilation High Radiation / 9	X						EK1.02 - Knowledge of the operational implications of the following concepts as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION : Radiation releases	4.1	59
295008 High Reactor Water Level / 2		X					AK2.08 - Knowledge of the interrelations between HIGH REACTOR WATER LEVEL and the following: Main turbine: Plant-Specific	3.4	60
295032 High Secondary Containment Area Temperature/ 5			X				EK3.01 - Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE : Emergency/normal depressurization	3.5	61
295007 High Reactor Pressure / 3				X			AA1.03 - Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE : RCIC: Plant-Specific	3.4	62
295029 High Suppression Pool Water Level / 5					X		EA2.01 - Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL : Suppression pool water level	3.9	63
295009 Low Reactor Water Level / 2						X	2.4.35 - Emergency Procedures / Plan: Knowledge of local auxiliary operator tasks during emergency and the resultant operational effects.	3.8	64
295010 High Drywell Pressure / 5		X					AK2.05 - Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following: Drywell cooling and ventilation	3.7	65
K/A Category Totals:	1	2	1	1	1/2	1/1	Group Point Total:	7/3	

**SSES 2013 #1**  
**Written Examination Outline**  
**Plant Systems – Tier 2 Group 1**

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp	Q#
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259002 Reactor Water Level Control												A2.07 - Ability to (a) predict the impacts of the following on the REACTOR WATER LEVEL CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of comparator bias signal	2.5	86
205000 Shutdown Cooling												A2.09 - Ability to (a) predict the impacts of the following on the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions Reactor low water level	3.8	87
262001 AC Electrical Distribution											X	2.4.11 - Emergency Procedures / Plan: Knowledge of abnormal condition procedures.	4.2	88
261000 SGTS											X	2.1.20 - Conduct of Operations: Ability to interpret and execute procedure steps.	4.6	89
400000 Component Cooling Water											X	2.2.42 - Equipment Control : Ability to recognize system parameters that are entry-level conditions for Technical Specifications	4.6	90
215004 Source Range Monitor	X											K1.02 - Knowledge of the physical connections and/or cause- effect relationships between SOURCE RANGE MONITOR (SRM) SYSTEM and the following: Reactor manual control	3.4	1
259002 Reactor Water Level Control	X											K1.08 - Knowledge of the physical connections and/or cause- effect relationships between REACTOR WATER LEVEL CONTROL SYSTEM and the following: Recirculation system: Plant-Specific	3.2	2
262001 AC Electrical Distribution	X											K2.01 - Knowledge of electrical power supplies to the following: Off-site sources of power	3.4	3
209001 LPCS		X										K2.03 - Knowledge of electrical power supplies to the following: Initiation Logic	2.9	4
215005 APRM / LPRM				X								K3.03 - Knowledge of the effect that a loss or malfunction of the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM will have on following: Reactor manual control system: Plant-Specific	3.3	5

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Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G		Imp	Q#
264000 EDGs			X										3.9	6
218000 ADS				X									3.8	7
217000 RCIC				X									3.5	8
263000 DC Electrical Distribution	X												3.2	9
300000 Instrument Air					X								2.5	10
205000 Shutdown Cooling						X							2.7	11
239002 SRVs						X							3.0	12
400000 Component Cooling Water							X						2.8	13
223002 PCIS/Nuclear Steam Supply Shutoff							X						3.7	14

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Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp	Q#
215003 IRM								X				A2.01 - Ability to (a) predict the impacts of the following on the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Power supply degraded	2.8	15
206000 HPCI								X				A2.10 - Ability to (a) predict the impacts of the following on the HIGH PRESSURE COOLANT INJECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: System isolation: BWR-2,3,4	3.9	16
261000 SGTS									X			A3.03 - Ability to monitor automatic operations of the STANDBY GAS TREATMENT SYSTEM including: Valve operation	3.0	17
212000 RPS									X			A3.07 - Ability to monitor automatic operations of the REACTOR PROTECTION SYSTEM including: SCRAM air header pressure	3.6	18
211000 SLC										X		A4.08 - Ability to manually operate and/or monitor in the control room: System initiation: Plant-Specific	4.2	19
203000 RHR/LPCI: Injection Mode										X		A4.09 - Ability to manually operate and/or monitor in the control room: System flow	4.1	20
262002 UPS (AC/DC)											X	2.1.32 - Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.8	21
215004 Source Range Monitor											X	2.1.28 - Knowledge of the purpose and function of major system components and controls.	4.1	22
209001 LPCS									X			A3.02 - Ability to monitor automatic operations of the LOW PRESSURE CORE SPRAY SYSTEM including: Pump start	3.8	23
211000 SLC	X											K1.02 - Knowledge of the physical connections and/or cause- effect relationships between STANDBY LIQUID CONTROL SYSTEM and the following: Core plate differential pressure indication	2.7	24

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Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp <sup>o</sup>	Q#
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262001 AC Electrical Distribution			X										K3.06 Knowledge of the effect that a loss or malfunction of the A.C. ELECTRICAL DISTRIBUTION will have on following: Reactor protection system	3. 8	25
239002 SRVs								X					A2.03 Ability to (a) predict the impacts of the following on the RELIEF/SAFETY VALVES ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck open SRV	4. 1	26
K/A Category Totals:	5	1	2	3	1	2	2	3/2	3	2	2/3		Group Point Total:		26/5

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Written Examination Outline  
Plant Systems – Tier 2 Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G		Imp.	Q #
245000 Main Turbine Gen. / Aux.								X				A2.09 - Ability to (a) predict the impacts of the following on the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS : and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Turbine vibration	2.8	91
201006 RWM											X	2.2.12 – Knowledge of surveillance procedures	3.4	92
286000 Fire Protection											X	2.4.31 - Emergency Procedures / Plan: Knowledge of annunciator alarms, indications or response procedures	4.1	93
202002 Recirculation Flow Control	X											K1.03 - Knowledge of the physical connections and/or cause- effect relationships between RECIRCULATION FLOW CONTROL SYSTEM and the following: Reactor core flow	3.7	27
201001 CRD Hydraulic		X										K2.05 - Knowledge of electrical power supplies to the following: Alternate rod insertion valve solenoids: Plant-Specific	4.5	28
215002 RBM			X									K3.01 - Knowledge of the effect that a loss or malfunction of the ROD BLOCK MONITOR SYSTEM will have on following: Reactor manual control system: BWR-3,4,5	3.3	29
202001 Recirculation				X								K4.05 - Knowledge of RECIRCULATION System design feature(s) and/or interlocks which provide for the following: Seal cooling	2.9	30
219000 RHR/LPCI: Torus/Pool Cooling Mode					X							K5.04 - Knowledge of the operational implications of the following concepts as they apply to RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE : Heat exchanger operation	2.9	31
290003 Control Room HVAC						X						K6.02 - Knowledge of the effect that a loss or malfunction of the following will have on the CONTROL ROOM HVAC : Component cooling water systems	2.7	32
268000 Radwaste							X					A1.02 - Ability to predict and/or monitor changes in parameters associated with operating the RADWASTE controls including: Off-site release	2.6	33

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Plant Systems – Tier 2 Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp.	Q #
271000 Off-gas								X				A2.10 - Ability to (a) predict the impacts of the following on the OFFGAS SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Offgas system high flow	3.1	34
201002 RMCS									X			A3.03 - Ability to monitor automatic operations of the REACTOR MANUAL CONTROL SYSTEM including: Rod drift alarm	3.2	35
259001 Reactor Feedwater										X		A4.04 - Ability to manually operate and/or monitor in the control room: System valves.	3.1	36
272000 Radiation Monitoring											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.	4.6	37
201003 Control Rod and Drive Mechanism							X					A1.02 - Ability to predict and/or monitor changes in parameters associated with operating the CONTROL ROD AND DRIVE MECHANISM controls including: CRD drive pressure	2.8	38
K/A Category Totals:	1	1	1	1	1	1	2	1/1	1	1	1/2	Group Point Total:	12/3	

Facility:	SSES 2013 #1	Date:	08/20/12			
Category	K/A #	Topic	RO		SRO-Only	
			IR	Q#	IR	Q#
1. Conduct of Operations	2.1.39	Knowledge of conservative decision making practices.			4.3	94
	2.1.35	Knowledge of the fuel-handling responsibilities of SRO's.			3.9	99
	2.1.1	Knowledge of Conduct of Operations requirements	3.8	66		
	2.1.37	Knowledge of procedures, guidelines, or limitations associated with reactivity management.	4.3	67		
	Subtotal			2		2
2. Equipment Control	2.2.14	Knowledge of the process for controlling equipment configuration or status.			4.3	95
	2.2.40	Ability to apply technical specifications for a system.			4.7	98
	2.2.35	Ability to determine Technical Specification Mode of Operation.	3.6	68		
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.2	69		
	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels	4.6	75		
	Subtotal			3		2
3. Radiation Control	2.3.5	Knowledge of radiation monitoring systems such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.			2.9	96
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, potable survey instruments, personnel monitoring equipment, etc.	2.9	70		

	2.3.13	Knowledge of Radiological Safety Procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc.	3.4	71		
	Subtotal			2		1
4. Emergency Procedures / Plan	2.4.37	Knowledge of the lines of authority during emergency plan implementation			4.1	97
	2.4.9	Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies			4.2	100
	2.4.1	Knowledge of EOP entry conditions and immediate action steps.	4.6	72		
	2.4.29	Knowledge of the emergency plan.	3.1	73		
	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.5	74		
Subtotal				3		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
2 / 1	209001 / K2.02	<p>(#4) K2.02 - Knowledge of electrical power supplies to the following: Valve power. Low discriminatory value.</p> <p>Randomly selected 209001 / K2.03 - Knowledge of electrical power supplies to the following: Initiation Logic</p>
2 / 1	263000 / K5.01	<p>(#9) K5.01 - Knowledge of the operational implications of the following concepts as they apply to D.C. ELECTRICAL DISTRIBUTION : Hydrogen generation during battery charging. Low discriminatory value.</p> <p>Randomly selected 263000 K1.02 - Knowledge of the physical connections and/or cause- effect relationships between D.C. ELECTRICAL DIATRIBUTION and the following: Battery charger and battery</p>
2 / 1	300000 / K5.13	<p>(#10) K5.13 - Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: Filters. Same KA randomly selected on 2010 NRC exam.</p> <p>Randomly selected 300000 / K5.01 - Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: Air Compressors</p>
2 / 1	261000 / A3.02	<p>(#17) A3.02 - Ability to monitor automatic operations of the STANDBY GAS TREATMENT SYSTEM including: Fan start Same KA randomly selected on 2011 NRC exam.</p> <p>Randomly selected 261000 / A3.03 - Ability to monitor automatic operations of the STANDBY GAS TREATMENT SYSTEM including: Valve operation</p>
2 / 1	215004 / 2.2.36	<p>(#22) 2.2.36 - Equipment Control: Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations. This is an SRO function.</p> <p>Randomly selected 215004 / 2.1.28 - Knowledge of the purpose and function of major system components and controls.</p>

2 / 1	262001 / K3.04	<p>(#25) K3.04 - Knowledge of the effect that a loss or malfunction of the A.C. ELECTRICAL DISTRIBUTION will have on following: Uninterruptible power supply. UPS/Battery topic oversampled.</p> <p>Randomly selected 262001 / K3.06 Knowledge of the effect that a loss or malfunction of the A.C. ELECTRICAL DISTRIBUTION will have on following: Reactor protection system</p>
2 / 1	239002 / 2.4.35	<p>(#26) 2.4.35 - Emergency Procedures / Plan: Knowledge of local auxiliary operator tasks during emergency and the resultant operational effects. (low reactor water level) Remote panel functions oversampled (#64 &amp; #45)</p> <p>Randomly selected 239002 / A2.03 Ability to (a) predict the impacts of the following on the RELIEF/SAFETY VALVES ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck open SRV</p>
2 / 1	272000 / 2.2.39	<p>(#37) 2.2.39 - Equipment Control: Knowledge of less than one hour technical specification action statements for systems.</p> <p>There are NO 1 hour or less TS for this system.</p> <p>Randomly selected 2.4.49 - Ability to perform without reference to procedures those actions that require immediate operation of system components and controls</p>
2 / 2	201003 / A3.01	<p>(#38) A3.01 - Ability to monitor automatic operations of the CONTROL ROD AND DRIVE MECHANISM including: Control rod position. System/concept oversampled.</p> <p>Randomly selected 201003 / A1.02 - Ability to predict and/or monitor changes in parameters associated with operating the CONTROL ROD AND DRIVE MECHANISM controls including: CRD drive pressure</p>
1 / 1	295038 / EA2.02	<p>(#53) EA2.02 - Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE : Total number of curies released This is a Rad Pro function.</p> <p>Randomly selected 295038 / EK2.09 - Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following:: Post accident sample system (PASS): Plant-Specific.</p>

1 / 1	295005 / 2.4.30	<p>(#55) 2.4.30 - Emergency Procedures / Plan; Knowledge of events related to system operation / status that must be reported to internal organizations or external agencies, such as the state, the NRC, or the transmission system operator. SRO level function.</p> <p>Randomly selected 295005 / 2.2.22 - Knowledge limiting conditions for operations and safety limits.</p>
1 / 1	700000 / 2.2.12	<p>(#56) 700000 / 2.2.12 - Equipment Control: Knowledge of surveillance procedures. No surveillance procedures associated with Grid Disturbance.</p> <p>Randomly selected 700000 / 2.1.19 – Conduct of Operations: Ability to use plant computers to evaluate system or component status.</p>
3 / 1	2.1.31	<p>(#66) 2.1.31 - Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup. This concept is significantly tested in the operating portion of the exam.</p> <p>Randomly selected 2.1.1 - Knowledge of Conduct of Operations requirements</p>
3 / 3	2.3.12	<p>(#70) 2.3.12 – Knowledge of Radiological Safety Procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc. Very similar to #71</p> <p>Randomly selected – 2.3.15 - Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.</p>
3 / 2	2.2.4	<p>(#75) 2.2.4 - (multi-unit license) Ability to explain the variations in control board layouts, systems, instrumentation and procedural actions between units at a facility. Same K/A used on previous exam.</p> <p>Randomly selected 2.2.2 – Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels</p>

1 / 1	295016 / AA2.05	<p>(#78) AA2.05 - Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT : Drywell pressure. No specific procedural reference to develop a discriminating SRO level question. APE also tested in #45</p> <p>Randomly selected 295031 EA2.04 - Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL: Adequate core cooling</p>
1 / 1	295023 / 2.1.27	<p>(#79) 2.1.27 - Conduct of Operations: Knowledge of system purpose and / or function. Not discriminatory at the SRO level.</p> <p>Randomly selected 2.1.23 – Ability to perform specific and integrated plant procedures during all modes of operation</p>
1 / 1	295028 / 2.1.31	<p>(#80) 2.1.31 - Conduct of Operations: Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup. This concept is significantly tested in the operating portion of the exam.</p> <p>Randomly selected 2.1.25 - Ability to interpret reference materials such as graphs, curves, tables, etc. (High drywell temperature)</p>
1 / 1	295025 / 2.2.12	<p>(#82) 2.2.12 - Equipment Control: Knowledge of surveillance procedures. No surveillance procedure associated with this EPE.</p> <p>Randomly selected EA2.02 – Ability to determine and/or interpret the following as they applies to HIGH REACTOR PRESSURE: Reactor power</p>
1 / 2	295033 / EA2.02	<p>(#85) EA2.02 - Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS : Equipment operability. Same general EOP topic/area covered in #61</p> <p>Randomly selected EA2.01 - Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS : Area radiation levels</p>

3 / 4	2.4.41	<p>(#97) 2.4.41 - Knowledge of the emergency action level thresholds and classifications. Oversample (see #81 and #85)</p> <p>Randomly selected 2.4.37 - Knowledge of the lines of authority during emergency plan implementation.</p>
2 / 2	201002 / 2.2.25	<p>(#92) 2.2.25 - Equipment Control: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.</p> <p>The RMCS is not referenced in Tech Specs, the TRM or in LCOs and Safety Limits. Also, 2.2.25 used on #69</p> <p>Randomly selected 201006 2.2.12 – Knowledge of surveillance procedures (RWM).</p>
2 / 2	400000 / 2.1.28	<p>(#90) 2.1.28 - Conduct of Operations: Knowledge of the purpose and function of major system components and controls. Not discriminating at the SRO level</p> <p>Randomly selected 2.2.42 - Equipment Control : Ability to recognize system parameters that are entry-level conditions for Technical Specifications</p>
3/4	2.4.20	<p>(#100) Emergency Procedures/Plan: Knowledge of operational implications of EOP warnings, cautions, and notes. This is common RO &amp; SRO knowledge level topic</p> <p>Randomly selected 2.4.9 - Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies</p>

Facility: Susquehanna  
 Examination Level: RO

Date of Examination: May 2013  
 Operating Test Number: 2013

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R	Calculate Drywell Leakage SO-100-006, K/A 2.1.7 (4.4)
Conduct of Operations	M, R	Determine Work Hour Controls NDAP-QA-0025, K/A 2.1.5 (2.9)
Equipment Control	D, R	Perform Jet Pump Operability Check SO-100-007, K/A 2.2.12 (3.7)
Radiation Control		
Emergency Procedures/Plan	D, S	Activate Fire Brigade ON-013-001 Attachment L, K/A 2.4.27 (3.4)
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank ( $\leq 3$ for ROs; $\leq 4$ for SROs & RO retakes) (N)ew or (M)odified from bank ( $\geq 1$ ) (P)revious 2 exams ( $\leq 1$ ; randomly selected)		

Facility: SusquehannaDate of Examination: May 2013Examination Level: SROOperating Test Number: 2013

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R	Calculate Drywell Leakage and Determine Technical Specification Impact SO-100-006, K/A 2.1.7 (4.7)
Conduct of Operations	M, R	Determine Work Hour Controls NDAP-QA-0025, K/A 2.1.5 (3.9)
Equipment Control	P, D, R NRC 2/2011	Perform LPRM Upscale Alarm Operability Tracking and Determine Required Actions OI-078-001, K/A 2.2.14 (4.3)
Radiation Control	D, R	Determine Ability to Bypass Secondary Containment Zone 2 Isolation OP-234-002, K/A 2.3.13 (3.8)
Emergency Procedures/Plan	M, R	Classify Emergency Conditions and Make Notification EP-PS-100, K/A 2.4.41 (4.6)
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank ( $\leq 3$ for ROs; $\leq 4$ for SROs & RO retakes) (N)ew or (M)odified from bank ( $\geq 1$ ) (P)revious 2 exams ( $\leq 1$ ; randomly selected)		

Facility: SusquehannaDate of Examination: May 2013Exam Level: ROOperating Test No.: 2013Control Room Systems<sup>@</sup> (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
a. Synchronize Diesel Generator D; Voltage Regulator Failure K/A 264000 A4.04 (3.7/3.7), SO-024-001D	D, A, EN, S	6
b. Lineup RHRSW to the Spent Fuel Pool K/A 233000 A2.02 (3.1/3.3), ON-135-001	P, D, S 2011 NRC	9
c. Swap Core Spray Loops K/A 209001 A4.01 (3.8/3.6), OP-151-001	N, EN, L, S	2
d. Reset Recirc Runback; Pump Speed Oscillates K/A 202002 A4.07 (3.3/3.2), ON-164-002	M, A, S	1
e. Main Steam Line Isolation Recovery K/A 239001 A4.01 (4.2/4.0), ON-184-001	D, L, S	3
f. Start HPCI in Pressure Control Mode; Pump Suction Clogging K/A 206000 A4.04 (3.7/3.7), OP-152-001	M, A, EN, S	4
g. Perform Control Room Evacuation Immediate Actions; High Pressure Injection Sources Misaligned K/A 212000 A4.01 (4.6/4.6), ON-100-109	M, A, EN, S	7
h. Vent the Drywell (RO Only) K/A 223001 A2.07 (4.2/4.3), OP-173-003	D, EN, S	5

In-Plant Systems<sup>@</sup> (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Pull Scram Fuses; Vent Scram Air Header K/A 295037 EA1.01 (4.6/4.6), ES-158-001, EO-100-113	M, A, E, R	7
j. Start Containment Hydrogen Recombiner in Manual K/A 223001 A2.01 (4.3/4.4), OP-173-001	P, D, E, L 2010 NRC	5
k. Establish RPV Alternate Injection with Fire Protection (A LOOP) K/A 295031 EA1.01 (4.4/4.4), OP-149-001	D, E, L	8

<sup>@</sup> 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
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / $\geq 1$ (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

Simulator Pairings:

A then B

D then H

F then E

C alone

G alone

Facility: SusquehannaDate of Examination: May 2013Exam Level: SRO-IOperating Test No.: 2013Control Room Systems<sup>@</sup> (8 for RO); (**7 for SRO-I**); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
a. Synchronize Diesel Generator D; Voltage Regulator Failure K/A 264000 A4.04 (3.7/3.7), SO-024-001D	D, A, EN, S	6
b. Lineup RHRSW to the Spent Fuel Pool K/A 233000 A2.02 (3.1/3.3), ON-135-001	P, D, S 2011 NRC	9
c. Swap Core Spray Loops K/A 209001 A4.01 (3.8/3.6), OP-151-001	N, EN, L, S	2
d. Reset Recirc Runback; Pump Speed Oscillates K/A 202002 A4.07 (3.3/3.2), ON-164-002	M, A, S	1
e. Main Steam Line Isolation Recovery K/A 239001 A4.01 (4.2/4.0), ON-184-001	D, L, S	3
f. Start HPCI in Pressure Control Mode; Pump Suction Clogging K/A 206000 A4.04 (3.7/3.7), OP-152-001	M, A, EN, S	4
g. Perform Control Room Evacuation Immediate Actions; High Pressure Injection Sources Misaligned K/A 212000 A4.01 (4.6/4.6), ON-100-109	M, A, EN, S	7

In-Plant Systems<sup>@</sup> (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Pull Scram Fuses; Vent Scram Air Header K/A 295037 EA1.01 (4.6/4.6), ES-158-001, EO-100-113	M, A, E, R	7
j. Start Containment Hydrogen Recombiner in Manual K/A 223001 A2.01 (4.3/4.4), OP-173-001	P, D, E, L 2010 NRC	5
k. Establish RPV Alternate Injection with Fire Protection (A LOOP) K/A 295031 EA1.01 (4.4/4.4), OP-149-001	D, E, L	8

@

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

Simulator Pairings:

A then B

D then H

F then E

C alone

G alone

Facility: SusquehannaDate of Examination: May 2013Exam Level: SRO-UOperating Test No.: 2013Control Room Systems<sup>@</sup> (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
a. Synchronize Diesel Generator D; Voltage Regulator Failure K/A 264000 A4.04 (3.7/3.7), SO-024-001D	D, A, EN, S	6
c. Swap Core Spray Loops K/A 209001 A4.01 (3.8/3.6), OP-151-001	N, EN, L, S	2
f. Start HPCI in Pressure Control Mode; Pump Suction Clogging K/A 206000 A4.04 (3.7/3.7), OP-152-001	M, A, EN, S	4

In-Plant Systems<sup>@</sup> (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Pull Scram Fuses; Vent Scram Air Header K/A 295037 EA1.01 (4.6/4.6), ES-158-001, EO-100-113	M, A, E, R	7
k. Establish RPV Alternate Injection with Fire Protection (A LOOP) K/A 295031 EA1.01 (4.4/4.4), OP-149-001	D, E, L	8

<sup>@</sup> 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
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / $\geq 1$ (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

Simulator Pairings:

A then B

D then H

F then E

C alone

G alone

## Appendix D

## Scenario Outline

Form ES-D-1

Facility: SusquehannaScenario No.: NRC-1Op-Test No.: 2013

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: The plant is operating at approximately 100% power. EHC pump A is out of service for maintenance. RCIC is out of service for maintenance.

Turnover: Transfer Bus 1A202 to the alternate supply per OP-104-001 section 2.1.4. Then lower Reactor power with Recirculation flow to approximately 92% per GO-100-012 section 5.3 and Reactivity Manipulation Package.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Transfer Bus 1A202 to the Alternate Supply OP-104-001
2	N/A	R – ATC, SRO	Lower Reactor Power with Recirculation Flow to 92% GO-100-012
3	cmfNB03_PSB 211N023A cmfRL02_C72 1K14A IMF cmfRL02_C72 1K14E	I – SRO	Division 1 RPS reactor pressure transmitter fails AR-103-001 (B02), Technical Specifications
4	mfFW145007A	C – All	Feedwater Pump A High Vibrations with Delayed Pump Trip AR-101-001 (A16), OP-145-001, ON-164-002
5	cmfRL02_E11 1K11A mfRH149004B	C – BOP, SRO	RHR Pump B Spurious Start and Suction Flange Leak into Reactor Building ON-169-002, EO-000-104, Technical Specifications
6	mfHP152009 mfHP152003	M – All	HPCI Steam Leak into Reactor Building EO-000-104, ON-100-101, EO-000-102
7	cmfMV06_HV 155F002 cmfMV06_HV 155F003 cmfMV09_HV 155F002 cmfMV09_HV 155F003	I – BOP, SRO	HPCI Fails to Automatically Isolate, HPCI Isolation Valves Stick Mid-Position When Manually Closed EO-000-104, EO-000-112
8	mfRD155006 cmfSC04	C – All	Multiple Control Rods Fail to Insert EO-000-102, EO-000-113

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

## Appendix D

## Scenario Outline

Form ES-D-1

Facility: SusquehannaScenario No.: NRC-2Op-Test No.: 2013

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: The plant is operating at approximately 100% power. EHC pump A is out of service for maintenance. RCIC is out of service for maintenance.

Turnover: Perform half scram testing for RPS scram channel A1 per SO-158-001.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Perform Half Scram Testing SO-158-001
2	rfDB105 101	C – All	MCC 1B217 De-Energizes, Loss of Power to Drywell Spray Valves, Loss of RPS Bus A ON-158-001, Technical Specifications
3	Report	R – ATC, SRO	Power Reduction Due to Minimum Generation Emergency Notification OI-AD-029, GO-100-012
4	mfHP1520 04	I – BOP, SRO	HPCI Inadvertent Initiation ON-156-001, Technical Specifications
5	cmfTH02_ TE14357A 1A2	C – All	Recirculation Pump A High Temperature AR-102-001 (G03), ON-164-002, Technical Specifications
6	cmfBR03_ 1A10201 cmfBR03_ 1A10204	C – All	Electrical Fault on Bus 11B ON-103-003, ON-100-101, EO-000-102
7	mfRR1640 11A	M – All	Reactor Coolant Leak in Drywell EO-000-102, EO-000-103
8	mfFW1440 03A(C)	C – All	Trip of Condensate Pumps 1A and 1C EO-000-102
9	mfHP1520 15	C – All	HPCI Trip EO-000-102, EO-000-112
10	mfAD1830 01	C – BOP, SRO	ADS Fails to Automatically Initiate EO-000-102, EO-000-112

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

## Appendix D

## Scenario Outline

Form ES-D-1

Facility: SusquehannaScenario No.: NRC-3Op-Test No.: 2013

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: The plant is operating at approximately 90% power. Core Spray pump A is out of service for maintenance.

Turnover: Swap EHC pumps per OP-193-003 section 2.9. Then raise Reactor power with Recirculation flow per GO-100-012 section 5.4 and Reactivity Manipulation Package.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Swap EHC Pumps OP-193-003
2	N/A	R – ATC, SRO	Raise Reactor Power with Recirculation Flow GO-100-012
3	mfTC1930 03	C – ATC, SRO	EHC Oscillations ON-193-001
4	cmfRV04_ PSV141F1 3K	C – BOP, SRO	SRV Inadvertently Opens ON-183-001, Technical Specifications
5	cmfMV01_ HV151F02 4A(B)	C – BOP, SRO	Suppression Pool Cooling Valve Breaker Trip OP-149-005, Technical Specifications
6	mfMS1830 10K mfMS1830 13K	C – All	SRV Leaks with Cracked Tailpipe ON-100-101, EO-000-102, EO-000-103
7	mfRP1580 04A(B)(C)( D)	M – All	Electrical ATWS EO-000-102, EO-000-113
8	rfRD15502 2	C – BOP, SRO	CRD Pumps Trip on Low Suction Pressure EO-000-113
9	mfSL1530 01A(B) cmfPM03_ 1P208A(B)	C – BOP, SRO	SLC Squib Valves Fail to Open on Start of First Pump, Subsequent SLC Pump Starts and Trips EO-000-113

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