Facility: **SSES Units 1 and 2** Date of Exam: **08/22/14 (LOC26)**

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	4	3	4				3	3			3	20	3		4		7
	2	1	1	1				1	2			1	7	2		1		3
	Tier Totals	5	4	5				4	5			4	27	5		5		10
2. Plant Systems	1	3	3	2	3	3	2	2	2	2	2	2	26	2		3		5
	2	1	1	1	1	1	1	1	1	1	1	2	12	0	1	2		3
	Tier Totals	4	4	3	4	4	3	3	3	3	3	4	38	3		5		8
3. Generic Knowledge & Abilities Categories		1			2			3			4		10	1	2	3	4	7
		3			2			3			2			1	2	2	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 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

BWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1 (RO / SRO)

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	IR	Q#
600000 Plant Fire On-site / 8					X		AA2.04 - Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: The fire's extent of potential operational damage to plant equipment	3.1	76
700000 Generator Voltage and Electric Grid Disturbances					X		AA2.01 - Ability to determine and/or interpret the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Operating point on the generator capability curve.	3.6	77
295005 Main Turbine Generator Trip / 3					X		AA2.02 - Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP : Turbine vibration	2.7	78
295030 Low Suppression Pool Water Level / 5						X	2.4.41 - Emergency Procedures / Plan: Knowledge of the emergency action level thresholds and classifications.	4.6	79
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1						X	2.4.35 - Emergency Procedures / Plan: Knowledge of local auxiliary operator tasks during emergency and the resultant operational effects.	4.0	80
295021 Loss of Shutdown Cooling / 4						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.	4.7	81
295019 Partial or Total Loss of Inst. Air / 8						X	2.1.19 - Conduct of Operations: Ability to use plant computers to evaluate system or component status.	3.8	82
295028 High Drywell Temperature / 5	X						EK1.01 - Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL TEMPERATURE : Reactor water level measurement	3.5	39
700000 Generator Voltage and Electric Grid Disturbances	X						AK1.01 - Knowledge of the operational implications of the following concepts as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES and the following: Definition of terms: volts, watts, amps, VARs, power factor.	3.3	40
295021 Loss of Shutdown Cooling / 4	X						AK1.04 - Knowledge of the operational implications of the following concepts as they apply to LOSS OF SHUTDOWN COOLING : Natural circulation	3.6	41
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	42
295005 Main Turbine Generator Trip / 3		X					AK2.02 - Knowledge of the interrelations between MAIN TURBINE GENERATOR TRIP and the following: Feedwater temperature	2.9	43
295031 Reactor Low Water Level / 2		X					EK2.15 - Knowledge of the interrelations between REACTOR LOW WATER LEVEL and the following: A.C. distribution: Plant-Specific	3.2	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

BWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1 (RO / SRO)

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	IR	Q#
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1			X				EK3.01 - Knowledge of the reasons for the following responses as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN : Recirculation pump trip/runback	4.1	46
295038 High Off-site Release Rate / 9			X				EK3.03 - Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: Control room ventilation isolation	3.7	47
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	48
295004 Partial or Total Loss of DC Pwr / 6				X			AA1.01 - Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : D.C. electrical distribution systems	3.3	49
295018 Partial or Total Loss of CCW / 8				X			AA1.01 - Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : Backup systems	3.3	50
295030 Low Suppression Pool Water Level / 5					X		EA2.03 - Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: Reactor pressure	3.9	51
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					X		AA2.05 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Jet pump operability: Not-BWR-1&2	3.1	52
295024 High Drywell Pressure / 5					X		EA2.06 - Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE: Suppression pool temperature	4.1	53
295023 Refueling Accidents / 8						X	2.4.18 Knowledge of the specific bases for EOPs.	3.3	54
295003 Partial or Complete Loss of AC / 6						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	55
295019 Partial or Total Loss of Inst. Air / 8						X	2.4.9 - Emergency Procedures / Plan: Knowledge of low power / shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.	3.8	56
295025 High Reactor Pressure / 3	X						EK1.03 - Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE : Decay heat generation	3.9	57
295006 SCRAM / 1			X				AK3.06 - Knowledge of the reasons for the following responses as they apply to SCRAM : Recirculation pump speed reduction: Plant-Specific	3.2	58
K/A Category Totals:	4	3	4	3	3/3	3/4	Group Point Total:		20/7

BWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2 (RO / SRO)

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	IR	Q#
295020 Inadvertent Cont. Isolation / 5 & 7					X		AA2.03 - Ability to determine and/or interpret the following as they apply to INADVERTENT CONTAINMENT ISOLATION : Reactor power	3.7	83
295002 Loss of Main Condenser Vac / 3						X	2.4.21 - Emergency Procedures / Plan: Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	4.6	84
295022 Loss of CRD Pumps / 1					X		AA2.03 - Ability to determine and/or interpret the following as they apply to LOSS OF CRD PUMPS : CRD mechanism temperatures	3.2	85
295002 Loss of Main Condenser Vacuum	X						AK1.04 - Knowledge of the operational implications of the following concepts as they apply to LOSS OF MAIN CONDENSER VACUUM : Increased offgas flow.	3.0	59
295017 High Off-site Release Rate / 9		X					AK2.14 - Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: PCIS/NSSSS	4.0	60
500000 High CTMT Hydrogen Conc. / 5			X				EK3.07 - Knowledge of the reasons for the following responses as they apply to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS: Operation of drywell vent	3.1	61
295008 High Reactor Water Level / 2				X			AA1.07 - Ability to operate and/or monitor the following as they apply to HIGH REACTOR WATER LEVEL : Main turbine: Plant-Specific	3.4	62
295022 Loss of CRD Pumps / 1					X		AA2.02 - Ability to determine and/or interpret the following as they apply to LOSS OF CRD PUMPS : CRD system status	3.3	63
295007 High Reactor Pressure / 3						X	2.4.6 - Emergency Procedures / Plan: Knowledge of EOP mitigation strategies.	3.7	64
295029 High Suppression Pool Water Level / 5					X		EA2.03 - Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL : Drywell/containment water level	3.4	65
K/A Category Totals:	1	1	1	1	2/2	1/1	Group Point Total:		7/3

BWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 2 Group 1 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	Q#
263000 DC Electrical Distribution								X				A2.02 - Ability to (a) predict the impacts of the following on the D.C. ELECTRICAL DISTRIBUTION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of ventilation during charging	2.9	86
209001 LPCS								X				A2.01 - Ability to (a) predict the impacts of the following on the LOW PRESSURE CORE SPRAY SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Pump trips	3.4	87
262001 AC Electrical Distribution											X	2.1.32 - Conduct of Operations: Ability to explain and apply all system limits and precautions.	4.0	88
223002 PCIS/Nuclear Steam Supply Shutoff											X	2.2.40 - Equipment Control: Ability to apply technical specifications for a system.	4.7	89
400000 Component Cooling Water											X	2.1.20 - Ability to interpret and execute procedure steps.	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
205000 Shutdown Cooling	X											K1.08 - Knowledge of the physical connections and/or cause- effect relationships between SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) and the following: LPCI	3.9	2
212000 RPS		X										K2.02 - Knowledge of electrical power supplies to the following: Analog trip system logic cabinets	2.7	3
239002 SRVs		X										K2.01 - Knowledge of electrical power supplies to the following: SRV solenoids	2.8	4
259002 Reactor Water Level Control			X									K3.07 - Knowledge of the effect that a loss or malfunction of the REACTOR WATER LEVEL CONTROL SYSTEM will have on following: Reactor water level indication	3.4	5
211000 SLC			X									K3.01 - Knowledge of the effect that a loss or malfunction of the STANDBY LIQUID CONTROL SYSTEM will have on following: Ability to shutdown the reactor in certain conditions	4.3	6

BWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 2 Group 1 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	Q#
263000 DC Electrical Distribution				X								K4.02 - Knowledge of D.C. ELECTRICAL DISTRIBUTION design feature(s) and/or interlocks which provide for the following: Breaker interlocks, permissives, bypasses and cross ties: Plant-Specific	3.1	7
218000 ADS				X								K4.02 - Knowledge of AUTOMATIC DEPRESSURIZATION SYSTEM design feature(s) and/or interlocks which provide for the following: Allows manual initiation of ADS logic	3.8	8
215003 IRM					X							K5.01 - Knowledge of the operational implications of the following concepts as they apply to INTERMEDIATE RANGE MONITOR (IRM) SYSTEM : Detector operation	2.6	9
206000 HPCI					X							K5.02 - Knowledge of the operational implications of the following concepts as they apply to HIGH PRESSURE COOLANT INJECTION SYSTEM : Turbine shaft sealing: BWR-2,3,4	2.8	10
262002 UPS (AC/DC)						X						K6.02 - Knowledge of the effect that a loss or malfunction of the following will have on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) : D.C. electrical power	2.8	11
217000 RCIC						X						K6.04 - Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC): Condensate storage and transfer system	3.5	12
400000 Component Cooling Water							X					A1.01 - Ability to predict and / or monitor changes in parameters associated with operating the CCWS controls including: CCW flow rate	2.8	13
203000 RHR/LPCI: Injection Mode							X					A1.09 - Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) controls including: Component cooling water systems	2.9	14
223002 PCIS/Nuclear Steam Supply Shutoff								X				A2.05 - Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abn cond or ops. Nuclear boiler instrumentation failures	3.3	15

BWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 2 Group 1 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	Q#
215005 APRM / LPRM								X				A2.02 - Ability to (a) predict the impacts of the following on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions : Upscale or downscale trips	3.6	16
264000 EDGs									X			A3.04 - Ability to monitor automatic operations of the EMERGENCY GENERATORS (DIESEL/JET) including: Operation of the governor control system on frequency and voltage control	3.1	17
262001 AC Electrical Distribution									X			A3.02 - Ability to monitor automatic operations of the A.C. ELECTRICAL DISTRIBUTION including: Automatic bus transfer	3.2	18
300000 Instrument Air										X		A4.01 - Ability to manually operate and/or monitor in the control room: Pressure gauges	2.6	19
261000 SGTS										X		A4.04 - Ability to manually operate and/or monitor in the control room: Primary containment pressure	3.3	20
209001 LPCS											X	2.4.46 - Emergency Procedures / Plan: Ability to verify that the alarms are consistent with the plant conditions.	4.2	21
217000 RCIC											X	2.4.2 - Emergency Procedures / Plan: Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	4.5	22
206000 HPCI		X										K2.02 - Knowledge of electrical power supplies to the following: System pumps: BWR-2,3,4	2.8	23
262001 AC Electrical Distribution					X							K5.02 - Knowledge of the operational implications of the following concepts as they apply to A.C. ELECTRICAL DISTRIBUTION: Breaker control	2.6	24
261000 SGTS	X											K1.01 - Knowledge of the physical connections and/or cause- effect relationships between STANDBY GAS TREATMENT SYSTEM and the following: Reactor building ventilation system	3.4	25
400000 Component Cooling Water				X								K4.01 - Knowledge of CCWS design feature(s) and or interlocks which provide for the following: Automatic start of standby pump	3.4	26
K/A Category Totals:	3	3	2	3	3	2	2	2/2	2	2	2/3	Group Point Total:		26/5

BWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 2 Group 2 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	Q#
226001 RHR/LPCI: Containment Spray System Mode								X				A2.11 - Ability to (a) predict the impacts of the following on the RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Motor operated valve failures	3.0	91
241000 Reactor/Turbine Pressure Regulator											X	2.4.34 - Emergency Procedures / Plan: Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	4.1	92
234000 Fuel Handling Equipment											X	2.2.12 - Equipment Control: Knowledge of surveillance procedures.	4.1	93
215002 RBM	X											K1.05 - Knowledge of the physical connections and/or cause- effect relationships between ROD BLOCK MONITOR SYSTEM and the following: Four rod display: BWR-3,4,5	3.0	27
201001 CRD Hydraulic		X										K2.02 - Knowledge of electrical power supplies to the following: Scram valve solenoids	3.6	28
239001 Main and Reheat Steam			X									K3.15 - Knowledge of the effect that a loss or malfunction of the MAIN AND REHEAT STEAM SYSTEM will have on following: Reactor water level control	3.5	29
286000 Fire Protection				X								K4.03 - Knowledge of FIRE PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: Maintenance of fire header pressure	3.3	30
201003 Control Rod and Drive Mechanism					X							K5.05 - Knowledge of the operational implications of the following concepts as they apply to CONTROL ROD AND DRIVE MECHANISM : Reverse power effect	3.0	31
204000 RWCU						X						K6.05 - Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR WATER CLEANUP SYSTEM : A. C. power	2.6	32
230000 RHR/LPCI: Torus/Pool Spray Mode							X					A1.01 - Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: TORUS/SUPPRESSION POOL SPRAY MODE controls including: Suppression chamber pressure	3.8	33

BWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 2 Group 2 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	Q#
226001 RHR/LPCI: CTMT Spray Mode								X				A2.06 - Ability to (a) predict the impacts of the following on the RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: D.C. electrical failures	2.8	34
271000 Off-gas									X			A3.01 - Ability to monitor automatic operations of the OFFGAS SYSTEM including: Automatic system isolations	3.3	35
241000 Reactor/Turbine Pressure Regulator										X		A4.07 - Ability to manually operate and/or monitor in the control room: Main stop/throttle valves (operation)	3.5	36
201006 RWM											X	2.2.42 - Equipment Control:: Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	37
290002 Reactor Vessel Internals											X	2.2.40 - Equipment Control: Ability to apply technical specifications for a system.	3.4	38
K/A Category Totals:	1	1	1	1	1	1	1	1/1	1	1	2/2	Group Point Total:		12/3

Facility: **SSES Units 1 and 2**			Date of Exam: **08/22/14 (LOC26)**			
Category	K/A #	Topic	RO		SRO-Only	
			IR	Q#	IR	Q#
1. Conduct of Operations	2.1.34	Knowledge of primary and secondary plant chemistry limits.			3.5	94
	2.1.37	Knowledge of procedures, guidelines, or limitations associated with reactivity management.	4.3	66		
	2.1.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.	3.9	67		
	2.1.28	Knowledge of the purpose and function of major system components and controls.	4.1	75		
	Subtotal			3		1
2. Equipment Control	2.2.23	Ability to track Technical Specification limiting conditions for operations.			4.6	95
	2.2.19	Knowledge of maintenance work order requirements.			3.4	98
	2.2.39	Knowledge of less than one hour technical specification action statements for systems.	3.9	68		
	2.2.15	Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc.	3.9	69		
	Subtotal			2		2
3. Radiation Control	2.3.14	Knowledge of radiation or containment hazards that may arise during normal, abnormal, or emergency conditions or activities.			3.8	96
	2.3.6	Ability to approve release permits.			3.8	100
	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	70		
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	71		
	2.3.11	Ability to control radiation releases.	3.8	74		
	Subtotal			3		2
4. Emergency Procedures / Plan	2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.			4.4	97
	2.4.32	Knowledge of operator response to loss of all annunciators.			4.0	99
	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	72		
	2.4.22	Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.	3.6	73		
	Subtotal			2		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
SRO 2 / 2	215001 A2.07 Traversing In-core Probe	**Question 91** **Originally selected K/A** **Ability to (a) predict the impacts of the following on the TRAVERSING IN-CORE PROBE ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Failure to retract during accident conditions: Mark-I&II (Not-BWR1)** **Unable to write a discriminating question at the SRO level for this K/A. Randomly re-sampled system due to low discriminatory potential for TIPs and randomly sampled A2 K/A.** **226001 RHR/LPCI: Containment Spray System Mode** **A2.11 - Ability to (a) predict the impacts of the following on the RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Motor operated valve failures (3.0)**
SRO 1 / 1	600000 AA2.07 Plant Fire on Site	**Question 76** **Originally selected K/A** **Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: Whether malfunction is due to common-mode electrical failures** **Unable to write a psychometrically sound question related to the K/A at the SRO level. Replaced with randomly sampled K/A within original E/APE.** **AA2.04 - Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: The fire's extent of potential operational damage to plant equipment (3.1)**
SRO 2 / 1	400000 2.4.12 Component Cooling Water	**Question 90** **Originally selected K/A** **Emergency Procedures / Plan: Knowledge of the specific bases for EOPs** **Lack of information related to the CCW systems precluded writing a psychometrically sound question on this K/A. Replaced with randomly sampled K/A within original system.** **2.1.20 - Ability to interpret and execute procedure steps. (4.6)**

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO 1 / 1	295025 EK1.01 High Reactor Pressure	**Question 57** **Originally selected K/A** **Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE : Pressure effects on reactor power** **Rejected due to K/A sampled on 2013 LOC25 NRC exam, unable to develop a significantly modified question. Replaced with randomly sample K/A within EK1.** **EK1.03 - Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE : Decay heat generation**
RO 2 / 1	211000 K3.03 SLC	**Question 6** **Originally selected K/A** **Knowledge of the effect that a loss or malfunction of the STANDBY LIQUID CONTROL SYSTEM will have on following: Core plate differential pressure indication** **Rejected due to overlap on 2013 LOC25 NRC exam, unable to develop a significantly modified question. Replaced with randomly sample K/A within K3.** **K3.01 - Knowledge of the effect that a loss or malfunction of the STANDBY LIQUID CONTROL SYSTEM will have on following: Ability to shutdown the reactor in certain conditions**
RO 2 / 1	215005 A2.07 APRM / LPRM	**Question 16** **Originally selected K/A** **Ability to (a) predict the impacts of the following on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions: Recirculation flow channels flow mismatch** **Rejected due to overlap with operating test scenario LOC26-NRC-1, Event 5. Replaced with randomly sample K/A within A2.** **A2.02 - Ability to (a) predict the impacts of the following on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions: Upscale or downscale trips**

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO 1 / 1	295030 EA2.02 Low Suppression Pool Water Level	**Question 51** **Originally selected K/A** **Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL : Suppression pool temperature** **Rejected due to overlap with Question 48. Replaced with randomly sample K/A within EA2.** **EA2.03 - Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: Reactor pressure**
RO 1 / 1	295023 2.4.41 Refueling Accidents	**Question 54** **Originally selected K/A** **Emergency Procedures / Plan: Knowledge of the emergency action level thresholds and classifications.** **Rejected due to SRO-level knowledge and abilities required for this K/A. Replaced with randomly-sampled generic K/A.** **2.4.18 Knowledge of the specific bases for EOPs.**
RO 1 / 2	295013 AK1.01 High Suppression Pool Temperature	**Question 59** **Originally selected K/A** **Knowledge of the operational implications of the following concepts as they apply to HIGH SUPPRESSION POOL TEMPERATURE : Pool stratification.** **Rejected due to overlap with RO questions 48 and 53, and SRO question 82. Randomly sampled Tier 1 Group 2 APE 295002, Loss of Main Condenser Vacuum, to replace 295013. Randomly sampled AK1 under 295013 to obtain new K/A.** **AK1.04 - Knowledge of the operational implications of the following concepts as they apply to LOSS OF MAIN CONDENSER VACUUM : Increased offgas flow.**

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO 2 / 1	205000 K1.05 Shutdown Cooling	**Question 2** **Originally selected K/A** **Knowledge of the physical connections and/or cause-effect relationships between SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) and the following: Component cooling water systems** **Rejected due to overlap with RO question 13, 14, and SRO question 90. Replaced with randomly sample K/A within K1.** **K1.08 - Knowledge of the physical connections and/or cause- effect relationships between SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) and the following: LPCI**
RO 2 / 1	300000 K5.01 Instrument Air	**Question 24** **Originally selected K/A** **Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: Air compressors** **Rejected due to overlap on 2013 LOC25 NRC exam. Due to small number of K5 topics in 300000, randomly resampled for new Tier 2 Group 1 system and obtained 262001 A.C. Electrical Distribution. Randomly sampled K5 and obtained K/A** **K5.02 - Knowledge of the operational implications of the following concepts as they apply to A.C. ELECTRICAL DISTRIBUTION: Breaker control**
RO 1 / 1	295038 EK3.01 High Off-site Release Rate	**Question 47** **Originally selected K/A** **Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: Implementation of site emergency plan** **Rejected due to SRO-level knowledge and abilities required for this K/A. Replaced with randomly-sampled K/A from EK3:** **EK3.03 - Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: Control room ventilation isolation**

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO 2 / 2	**286000 K4.07 Fire Protection**	**Question 30** **Originally selected K/A** **K4.07 - Knowledge of FIRE PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: Diesel engine protection** **Rejected due to could not develop a question with reliable discrimination validity. Replaced with randomly-sampled K/A from K4:** **K4.03 - Knowledge of FIRE PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: Maintenance of fire header pressure**
RO 2 / 1	**206000 K5.06 HPCI**	**Question 9** **Originally selected K/A** **K5.06 - Knowledge of the operational implications of the following concepts as they apply to HIGH PRESSURE COOLANT INJECTION SYSTEM : Turbine speed measurement** **Rejected due to could not develop a question with reliable discrimination validity. Replaced with randomly-sampled K/A from K5:** **K5.02 - Knowledge of FIRE PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: Turbine shaft sealing**

ES-301	Administrative Topics Outline	Form ES-301-1

Facility: SSES Units 1 and 2	Date of Examination: August 11-22, 2014
Exam Level: RO ■ SRO □	Operating Test No.: LOC26

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, M	**Implement Reactor Coolant System Temperature Monitoring, HUR Exceeded (00.SO.1178.152)**
Conduct of Operations	S, D	**Implement On-Site Class 1E Operability Test for Inoperable Diesel Generator (24.SO.1475.202)**
Equipment Control	R, M	**Review and Verify Blocking Required per NDAP-QA-0322 (00.AD.3274.206)**
Radiation Control	S, N	**Perform Control Room Actions in Response to Fuel Handling Accident (81.ON.2356.001)**
Emergency Procedures/Plan		

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 (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

JPM Description

JPM COO1. The applicant will use provided plant process computer data to record and calculate reactor heatup rate. The heatup rate will have violated TS 3.4.10 limits. The SRO applicants will be required to identify the TS 3.4.10 Conditions entered with the corresponding Required Actions and Completion Times.

JPM COO2. The applicant will perform SO-024-013, Offsite Power Source and Onsite Class 1E Operability Test, in response to the failure of a Diesel Generator to satisfy TS 3.8.1 Required Action B.2. The test will identify that redundant required equipment is inoperable. The SRO applicants will be required to identify the applicable LCO not met and the Conditions to be entered, with the corresponding Required Actions and Completion Times.

JPM EC. The applicant will be required to evaluate the proposed blocking for maintenance on a loop of Core Spray. The proposed equipment clearance will include three deficiencies requiring correction or additional blocking to address.

JPM RC-RO. The applicant will be required to perform the Control Room actions in response to a fuel handling accident on the Refuel Floor per ON-081-001, Fuel Handling Accident. The applicant will perform a limited evacuation of the plant and initiate actions to secure plant personnel with Security and HP.

Facility: SSES Units 1 and 2		Date of Examination: August 11-22, 2014
Exam Level: RO ☐ SRO ■		Operating Test No.: LOC26
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, M	**Implement Reactor Coolant System Temperature Monitoring, HUR Exceeded (00.SO.1178.152)**
Conduct of Operations	S, D	**Implement On-Site Class 1E Operability Test for Inoperable Diesel Generator (24.SO.1475.202)**
Equipment Control	R, M	**Review and Verify Blocking Required per NDAP-QA-0322 (00.AD.3274.206)**
Radiation Control	R, D	**Respond to SGTS Exhaust High Radiation While Purging Primary Containment (00.AD.1018.101)**
Emergency Procedures/Plan	S, N	**Classify an Emergency Condition (scenario-specific)**

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 (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

JPM Description

JPM COO1. The applicant will use provided plant process computer data to record and calculate reactor heatup rate. The heatup rate will have violated TS 3.4.10 limits. The SRO applicants will be required to identify the TS 3.4.10 Conditions entered with the corresponding Required Actions and Completion Times.

JPM COO2. The applicant will perform SO-024-013, Offsite Power Source and Onsite Class 1E Operability Test, in response to the failure of a Diesel Generator to satisfy TS 3.8.1 Required Action B.2. The test will identify that redundant required equipment is inoperable. The SRO applicants will be required to identify the applicable LCO not met and the Conditions to be entered, with the corresponding Required Actions and Completion Times.

JPM EC. The applicant will be required to evaluate the proposed blocking for maintenance on a loop of Core Spray. The proposed equipment clearance will include three deficiencies requiring correction or additional blocking to address.

JPM RC-SRO. A purge of the Suppression Chamber is in progress. The SRO applicant will be provided with the status of radiation monitoring equipment associated with the Standby Gas Treatment system. The applicant will be required to recognize a failure of the automatic actions associated with a high radiation condition and formulate a response, including TS evaluation, manual actions required in response to the automatic action failure, and actions to assure personnel safety.

JPM EP. Each SRO applicant will be required to classify the events of the scenario in which they are evaluated as the Unit Supervisor. One JPM will be prepared, incorporating the events and correct classification for all of the simulator scenarios.

Facility: SSES Units 1 and 2	Date of Examination: August 11-22, 2014	
Exam Level: RO ■ SRO-I ☐ SRO-U ☐	Operating Test No.: LOC26	
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. **Respond to Control Rod Drift In During Performance of Rod Exercise Test (55.ON.1998.151)**	**A,D,S**	**1**
b. **Shutdown RFP Primary Woodward Governor, RFP Speed Oscillates (45.OP.1671.151)**	**A,N,S**	**2**
c. **Start HPCI in Pressure Control Mode (52.OP.1950.101)**	**EN,M,S**	**4**
d. **Place Shell Warming in Service, Warming Demand Fails High (93.OP.2440.151)**	**A,N,L,S**	**3**
e. **Vent the Drywell (73.OP.2287.101)**	**D,P,S**	**5**
f. **Energize ESS Transformer 211, Re-Energize ESS Bus 2D after Transformer Lockout (04.OP.2529.151)**	**A,EN,N,S**	**6**
g. **Restore Bypassed Control Rod Position in RWM (31.OP.1552.101)**	**L,N,S**	**7**
h. **Perform RBCCW System Flush, RBCCW Pump Trips (14.ON.1335.151)**	**A,N,S**	**8**
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. **Manual Emergency Shutdown of Diesel Generator A from Panel 0C521A (24.OP.1443.051)**	**A,D,EN**	**6**
j. **Venting Suppression Chamber without Radiological Release Limitations (73.EO.2282.101)**	**D,E,EN,R**	**9**
k. **Perform Operator Actions Outside the Control Room in Accordance With ON-100-009 (00.ON.1153.102)**	**D,E**	**7**

@ 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	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(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 Description

JPM A. The monthly control rod exercise is performed. The first 2 control rods are tested with no incident. The 3rd control rod drifts to an intermediate position when an insert signal is applied. The off-normal procedure for control rod problems is used to insert the control rod to the full-in position.

JPM B. RFP B has just been placed in-service as the second RFP in Flow Control Mode. Speed control is transferred to the Backup Woodward Governor due to concerns with control valve position feedback to the Primary. After control is transferred RFPT B speed begins oscillating, requiring the RFPT Backup Woodward Governor to be shutdown to stop the oscillations.

JPM C. A manual startup of the HPCI system is performed for pressure control. HPCI system flow and discharge pressure are to be maximized to initiate a reactor cooldown with MSIVs closed.

JPM D. Unit startup is in progress. Shell warming is returned to service following a planned turbine trip. As HP turbine pressurization begins, the warming demand fails high. Shell warming must be secured or the turbine tripped before a reactor scram on Main Turbine TSV/TCV closure is generated as HP first stage pressure exceeds the RPS scram bypass setpoint.

JPM E. Drywell pressure is elevated with the plant operating at nominal rated power conditions. SGTS is started and a vent path created to lower Drywell pressure. Once Drywell pressure begins lowering, the vent path is secured.

JPM F. ESS Transformer 201 is to be returned to service following maintenance, with ESS Bus 2D returned to the normal supply. The transformer will be re-energized, but when ESS Bus 2D is transferred the transformer experiences a lockout. ESS Bus 2D is then re-energized from Diesel Generator D.

JPM G. A reactor startup is in progress at less than 5 percent power. A substitute control rod position has been entered for a partially withdrawn control rod with a bad position indication at a specific notch. The control rod has been withdrawn past the position with the bad indication and the substituted position is deleted.

JPM H. A flush of the RBCCW system per GO-100-014 for hot weather operation is to be performed. The in-service RBCCW pump trips when the flush is initiated. The standby pump fails to automatically start and must be manually started. The standby pump is air-bound and fails to develop flow, requiring the pump to be vented per the off-normal position.

JPM I. A local emergency stop of Diesel Generator A(B) is to be performed due to loss of cooling water. The emergency stop PB fails to trip the DG. The DG must be stopped by isolating the fuel oil supply.

JPM J. A Station Blackout and LOCA has occurred with Drywell pressure approaching design limits. A vent path from the Suppression Chamber to the Unit 1 Reactor Building is manually established by removal of a ductwork access panel to serve as a vent and manual opening of vent isolation dampers.

JPM K. The Control Room was evacuated due to a fire. Operators failed to scram the Unit 1 reactor before leaving the Control Room. Local actions to scram the reactor and ensure MSIVs remain closed are performed.

Facility: SSES Units 1 and 2	Date of Examination: August 11-22, 2014	
Exam Level: RO ☐ SRO-I ■ SRO-U ☐	Operating Test No.: LOC26	
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. **Respond to Control Rod Drift In During Performance of Rod Exercise Test (55.ON.1998.151)**	**A,D,S**	**1**
b. **Shutdown RFP Primary Woodward Governor, RFP Speed Oscillates (45.OP.1671.151)**	**A,N,S**	**2**
c. **Start HPCI in Pressure Control Mode (52.OP.1950.101)**	**EN,M,S**	**4**
d. **Place Shell Warming in Service, Warming Demand Fails High (93.OP.2440.151)**	**A,N,L,S**	**3**
e. **Vent the Drywell (73.OP.2287.101)**	**D,P,S**	**5**
f. **Energize ESS Transformer 211, Re-Energize ESS Bus 2D after Transformer Lockout (04.OP.2529.151)**	**A,EN,N,S**	**6**
g.		
h. **Perform RBCCW System Flush, RBCCW Pump Trips (14.ON.1335.151)**	**A,N,S**	**8**
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. **Manual Emergency Shutdown of Diesel Generator A from Panel 0C521A (24.OP.1443.051)**	**A,D,EN**	**6**
j. **Venting Suppression Chamber without Radiological Release Limitations (73.EO.2282.101)**	**D,E,EN,R**	**9**
k. **Perform Operator Actions Outside the Control Room in Accordance With ON-100-009 (00.ON.1153.102)**	**D,E**	**7**

@ 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	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(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 Description

JPM A. The monthly control rod exercise is performed. The first 2 control rods are tested with no incident. The 3rd control rod drifts to an intermediate position when an insert signal is applied. The off-normal procedure for control rod problems is used to insert the control rod to the full-in position.

JPM B. RFP B has just been placed in-service as the second RFP in Flow Control Mode. Speed control is transferred to the Backup Woodward Governor due to concerns with control valve position feedback to the Primary. After control is transferred RFPT B speed begins oscillating, requiring the RFPT Backup Woodward Governor to be shutdown to stop the oscillations.

JPM C. A manual startup of the HPCI system is performed for pressure control. HPCI system flow and discharge pressure are to be maximized to initiate a reactor cooldown with MSIVs closed.

JPM D. Unit startup is in progress. Shell warming is returned to service following a planned turbine trip. As HP turbine pressurization begins, the warming demand fails high. Shell warming must be secured or the turbine tripped before a reactor scram on Main Turbine TSV/TCV closure is generated as HP first stage pressure exceeds the RPS scram bypass setpoint.

JPM E. Drywell pressure is elevated with the plant operating at nominal rated power conditions. SGTS is started and a vent path created to lower Drywell pressure. Once Drywell pressure begins lowering, the vent path is secured.

JPM F. ESS Transformer 201 is to be returned to service following maintenance, with ESS Bus 2D returned to the normal supply. The transformer will be re-energized, but when ESS Bus 2D is transferred the transformer experiences a lockout. ESS Bus 2D is then re-energized from Diesel Generator D.

JPM H. A flush of the RBCCW system per GO-100-014 for hot weather operation is to be performed. The in-service RBCCW pump trips when the flush is initiated. The standby pump fails to automatically start and must be manually started. The standby pump is air-bound and fails to develop flow, requiring the pump to be vented per the off-normal position.

JPM I. A local emergency stop of Diesel Generator A(B) is to be performed due to loss of cooling water. The emergency stop PB fails to trip the DG. The DG must be stopped by isolating the fuel oil supply.

JPM J. A Station Blackout and LOCA has occurred with Drywell pressure approaching design limits. A vent path from the Suppression Chamber to the Unit 1 Reactor Building is manually established by removal of a ductwork access panel to serve as a vent and manual opening of vent isolation dampers.

JPM K. The Control Room was evacuated due to a fire. Operators failed to scram the Unit 1 reactor before leaving the Control Room. Local actions to scram the reactor and ensure MSIVs remain closed are performed.

Facility: SSES Units 1 and 2	Date of Examination: August 11-22, 2014	
Exam Level: RO ☐ SRO-I ☐ SRO-U ■	Operating Test No.: LOC26	
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.		
b. **Shutdown RFP Primary Woodward Governor, RFP Speed Oscillates (45.OP.1671.151)**	**A,N,S**	**2**
c.		
d. **Place Shell Warming in Service, Warming Demand Fails High (93.OP.2440.151)**	**A,N,L,S**	**3**
e.		
f. **Energize ESS Transformer 211, Re-Energize ESS Bus 2D after Transformer Lockout (04.OP.2529.151)**	**A,EN,N,S**	**6**
g.		
h.		
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i.		
j. **Venting Suppression Chamber without Radiological Release Limitations (73.EO.2282.101)**	**D,E,EN,R**	**9**
k. **Perform Operator Actions Outside the Control Room in Accordance With ON-100-009 (00.ON.1153.102)**	**D,E**	**7**

@ 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.

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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
(EN)gineered safety feature	- / - / ≥1 (control room system)
(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 Description

JPM B. RFP B has just been placed in-service as the second RFP in Flow Control Mode. Speed control is transferred to the Backup Woodward Governor due to concerns with control valve position feedback to the Primary. After control is transferred RFPT B speed begins oscillating, requiring the RFPT Backup Woodward Governor to be shutdown to stop the oscillations.

JPM D. Unit startup is in progress. Shell warming is returned to service following a planned turbine trip. As HP turbine pressurization begins, the warming demand fails high. Shell warming must be secured or the turbine tripped before a reactor scram on Main Turbine TSV/TCV closure is generated as HP first stage pressure exceeds the RPS scram bypass setpoint.

JPM F. ESS Transformer 201 is to be returned to service following maintenance, with ESS Bus 2D returned to the normal supply. The transformer will be re-energized, but when ESS Bus 2D is transferred the transformer experiences a lockout. ESS Bus 2D is then re-energized from Diesel Generator D.

JPM J. A Station Blackout and LOCA has occurred with Drywell pressure approaching design limits. A vent path from the Suppression Chamber to the Unit 1 Reactor Building is manually established by removal of a ductwork access panel to serve as a vent and manual opening of vent isolation dampers.

JPM K. The Control Room was evacuated due to a fire. Operators failed to scram the Unit 1 reactor before leaving the Control Room. Local actions to scram the reactor and ensure MSIVs remain closed are performed.

Facility: **SSES Units 1 and 2** Scenario No.: **1** Op-Test No.: **LOC26**

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions **Unit 1 95 percent power for control rod pattern adjustment, EOL**

HPCI OOSVC, DG E substituted for DG A (IC-380)

Turnover **RFP lube oil conditioner swapped from A to B last shift**

Control rods 42-15 and 46-19 declared slow last scram time test

Severe thunderstorm watch in effect

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R SRO,ATC	Withdraw control rods to raise reactor power 3 percent (OP-AD-338, GO-100-012)
2	N/A	N SRO,BOP	Place CRD Pump B in-service, secure CRD Pump A (OP-155-001)
3	mfFW145 007B	C SRO,ATC	RFPT B vibration rises, reduce RFPT speed to lower vibration (AR-101-A16)
4	mfFW145 007B	C All	RFPT B trips on high vibration, Recirc LIM2 runback (ON-164-002)
5	cmfTR03_ FTB31 1N014C	I SRO,ATC	APRM 2 and 3 Recirc Loop A drive flows fail high during Recirc LIM2 runback (TS 3.3.1.1)
6	cmfAV04_ TV11028	C SRO,BOP	RBCCW TCV fails, ESW placed in-service to restore RBCCW cooling (ON-114-001), ESW loop declared inoperable when aligned to RBCCW (TS 3.7.2)
7	rfCU161001 rfCU161009 cmfMV06_ HV144F004	I SRO,ATC	RWCU fails to automatically isolate on high temperature, manual isolation successful (AR-101-A01)
8	mfRD155 017	M ALL	Hydraulic-block ATWS (EO-100-113, OP-145-005, ES-158-002)
9	cmfPM03_ 1P208A cmfPM03_ 1P208B	C SRO,BOP	SLC pump trips after start, standby SLC pump successfully injects boron (OP-153-001)
10	cmfTR01_ LT14201A	I SRO,ATC	Wide Range level instrument fails, RFP flow must be raised to maintain reactor level in ATWS band
11	mfFW148 002	C ALL	In-service RFPT trips after first scram, RCIC restored to maintain RPV level while standby RFPT placed in-service

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Scenario Events	Actual Attributes
1. Total malfunctions (5–8)	**3,6,7,9,10,11**	**6**
2. Malfunctions after EOP entry (1–2)	**9,10,11**	**3**
3. Abnormal events (2–4)	**4,6**	**2**
4. Major transients (1–2)	**8**	**1**
5. EOPs entered/requiring substantive actions (1–2)	**EO-100-102**	**1**
6. EOP contingencies requiring substantive actions (0–2)	**EO-100-113**	**1**
7. Critical tasks (2–3) **CT-1 Inject SLC.** **CT-2 Lowers RPV level to < -60" but > -161".** **CT-3 Inserts control rods IAW EO-100-113 Sht. 2.**		**3**

SCENARIO SUMMARY

The scenario begins with Unit 1 at 95 percent power, 500 days into the operating cycle. Preparations are set for performing a control rod pattern adjustment. HPCI is in day 2 of a planned 4-day system outage window. Diesel Generator E is substituted for DG A for a system outage window. The RFP lube oil conditioner was swapped from the RFP A reservoir to the B reservoir last shift. Control rods 42-15 and 46-19 were declared slow during the last scram time test. A severe thunderstorm watch is in effect for northeast Pennsylvania for the next 12 hours.

The first task for the crew is to withdraw control rods in accordance with the Reactivity Maneuver Request provided by Reactor Engineering. The pattern adjustment will raise reactor power approximately 3 percent. When the pattern adjustment is complete, the crew will commence rotating CRD Pumps per OP-155-001 in support of scheduled maintenance on the next shift. WCC personnel will hang a clearance on CRD Pump 1A when it has been removed from service.

When the reactivity maneuver has been completed and CRD pump rotation is complete, RFP B will experience a rising vibration trend. Vibration will quickly rise to the alarm setpoint, then continue to rise at a slower rate toward the RFP trip setpoint. The crew should initiate action to first reduce the speed of the RFP per the associated alarm response procedure, then remove the pump from service. The vibration will rise to the trip setpoint when the crew takes manual control of RFP B speed or adjusts the speed bias. The crew will respond per off-normal procedures to the RFP trip and recirc LIM2 runback. Control rod insertion may be performed due to margin to the MELLA rod-line, but is not required. The Recirc loop A drive flow inputs to APRM flow channels C and D (APRMs 2 and 3) will drift high during the runback, resulting in a RBM flow compare control rod withdrawal block. The inoperable flow-biased scram and rod-block functions of the two APRMs will require entry into TS 3.3.1.1 and TRO 3.1.3.

When the crew has lowered power below the MELLA rod-line, the RBCCW TCV will malfunction resulting in a loss of cooling to RBCCW. RBCCW temperature will quickly rise. RWCU will fail to trip on high motor temperature or isolate on high F/D inlet temperature and must be manually tripped and isolated (F004). The RBCCW TCV bypass valve will be stuck closed. The crew will be required to place RBCCW on ESW which bypasses the RBCCW TCVs and will restore cooling to RBCCW loads. Entry into TS 3.7.2 will be required for the loop of ESW made inoperable when aligned to the RBCCW HX.

Once the crew has placed ESW in-service to RBCCW the supply valve HV11024A1 will fail closed after approximately 5 minutes, due to its solenoid failing, resulting in a total loss of RBCCW cooling. Recirc Pump A lower motor bearing temperature will rise rapidly on the second loss of cooling, requiring a reactor scram and tripping of the Recirc Pump. If the reactor is not scrammed before the recirc pump is tripped, Region 1 of the power-flow map will be entered and the reactor will automatically scram on OPRMs.

The reactor scram will result in a hydraulic-block ATWS. The crew will trip both Recirc Pumps and reduce level to the ATWS band to lower power. The crew will perform the ES to bypass RPS trips, allowing the scram to be reset to drain the SDV and scram again. The crew will be able to insert control rods using RMCS. The first SLC pump started will trip shortly after starting, requiring the second pump to be started. As reactor level is lowered one channel of Wide Range reactor level will fail, requiring the crew to diagnose the failure and raise FW flow to maintain reactor level within the ATWS band.

The first attempt at draining the SDV and re-inserting a scram will result in limited control rod motion. The crew should reset the scram and allow the SDV to drain again while continuing control rod insertion. The in-service RFP will trip after the scram is reset. RCIC can be used to maintain reactor level as the standby RFP is placed in service. The scenario may be terminated when level is stable in the ATWS band and the standby RFP has been placed in service.

Facility: **SSES Units 1 and 2** Scenario No.: **2** Op-Test No.: **LOC26**

Examiners: _____ Operators: _____

Initial Conditions: **Unit 1 80 percent power starting up from forced outage, BOL**
HPCI OOSVC

Turnover: **Swap RFP A main lube oil pumps**
RFP lube oil conditioner being swapped from A to B
Control rods 42-15 and 46-19 declared slow last scram time test
Severe thunderstorm watch in effect

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N SRO,BOP	Swap RFP A main lube oil pumps (OP-145-003)
2	rfDB105106	C All	1B227 feeder trips (AR-016-B04) and is inoperable (TS 3.8.7), re-energize RPS B from alternate (ON-158-001)
3	cmfPM02_ 1P124A(B)	C SRO,ATC	RFP A main lube oil pump trips due to FME (AR-120-A03), RFP A manually secured (OP-145-001)
4	N/A	R SRO,ATC	Reduce power to < 65 percent using recirc flow and control rods to secure RFP A (OP-AD-338)
5	cmfRL01_ B211K3B	I SRO	MSL flow transmitter fails high causing MSIV half-isolation (TS 3.6.1.3)
6	cmfRL02_ C721K6A-D cmfPM02_ 1P124C-D	I SRO,ATC	Insert manual scram on loss of Feedwater (only 1 RFP in-service), RPS low-level auto-scram is failed (OP-AD-004)
7	rfDS0010xx crfAB03_xx	M ALL	Loss of offsite power on reactor scram (ON-104-001)
8	mfDG024 001B	I SRO,BOP	Diesel Generator B fails to automatically start, manual start from Control Room successful (ON-104-001)
9	mfRR164 010 mfRR164 011A	M ALL	Drywell LOCA (EO-102, EO-103)
10	cmfRV02_ PSV141 F13G-N	I ALL	ADS auto-initiation fails, perform Rapid Depressurization (EO-112)

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

Event No.	Malf. No.	Event Type*	Event Description
11	**cmfMV06_ HV152 F005A**	**I ALL**	**Division 1 Core Spray injection valve fails to automatically open, can be manually opened from Control Room**
12	**cmfRL01_ E111Kxxx cmfMV06_ HV151 F015B**	**I ALL**	**Division 2 RHR LPCI initiation logic fails to initiate, manual alignment to LPCI required**

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Scenario Events	Actual Attributes
1. Total malfunctions (5–8)	**2,3,6,8,10,11, 12**	**7**
2. Malfunctions after EOP entry (1–2)	**8,10,11,12**	**4**
3. Abnormal events (2–4)	**2,6**	**2**
4. Major transients (1–2)	**7,9**	**2**
5. EOPs entered/requiring substantive actions (1–2)	**EO-100-102 EO-100-103**	**2**
6. EOP contingencies requiring substantive actions (0–2)	**EO-100-102 (ALC) EO-100-112**	**2**
7. Critical tasks (2–3) **CT-1 Rapid Depressurization at TAF** **CT-2 Manually align Division 1 Core Spray and Division 2 RHR for reactor vessel injection**		

SCENARIO SUMMARY

The scenario begins with Unit 1 at 80 percent power starting up from a forced outage, 50 days into the operating cycle. HPCI is inoperable with the steam supply isolated to repair a small steam leak in the steam supply piping in the HPCI room. The RFP lube oil conditioner is being placed on the RFP B reservoir after being removed from the RFP A reservoir last shift in preparation for a RFP A main lube oil pump test. Control rods 42-15 and 46-19 were declared slow during the last scram time test. A severe thunderstorm watch is in effect for northeast Pennsylvania for the next 12 hours.

The first task for the crew is to test the RFP A main lube oil pumps, and perform a pump swap in the process, per OP-145-003. NPOs will report the RFP lube oil conditioner is in-service on the RFP B reservoir once the lube oil pump swap is complete.

When the RFP lube oil pump swap is complete, the 1B227 feeder breaker 1B220-013 will trip, de energizing the MCC and RPS B. The MCC will not be recovered during the scenario. The crew will respond per ON-158-001 to re-energize RPS B and reset the half-scram, reset NSSSS logic, and restore cooling to the Recirc Pumps. The crew should reference ON 104-202 to identify other significant loads affected by the loss of the MCC, which include Division 2 Core Spray and Division 2 RHR Drywell spray. TS 3.8.7 should be entered for the inoperable ESS MCC.

Once activities associated with recovery from the loss of 1B227 are complete, RFP A main lube oil pump B (1P124B) will trip. Investigation will show significant quantities of foreign material in the reservoir with failure of the remaining RFP A main lube oil pump (1P124A) expected. The crew should reduce power per GO 100-012 and remove RFP A from service per OP-145-001. During the power reduction a MSL B flow transmitter will fail high, resulting in a MSIV half-isolation signal. The inoperable transmitter will require entry into TS 3.3.6.1.

Once RFP A has been secured and the MSL flow transmitter failure evaluated, the RFP B in-service main lube oil pump (1P124C) will trip. The standby pump (1P124D) will automatically start, but trip almost immediately, resulting in a trip of RFP B. With only 1 RFP in-service reactor level will fall rapidly. The scram on low RPV level will fail, requiring a manual scram.

The Unit 1 reactor scram will initiate a grid disturbance which will result in a total loss of offsite power. Diesel Generator B will fail to start, but can be automatically started from the Control Room to re-energize ESS Buses 1B and 2B. The crew will respond to the Scram and LOOP per EO-102 and ON-104-001. RPV level and pressure control will be with RCIC and SRVs.

Once RPV level and pressure are stabilized after the LOOP, a small RCS leak will develop in the Drywell. The leak will be within the capability of RCIC and CRD to maintain RPV level above TAF. The crew response to the LOCA will be to align RHR for containment cooling. Once RHR is aligned for containment cooling, the leak will degrade resulting in level slowly falling below TAF. ADS will fail to initiate. Rapid Depressurization will be performed per EO-112 once level falls below TAF.

Low-pressure ECCS systems will fail to respond automatically to the LPCI initiation signal, requiring operator action to initiate ECCS flow to recover RPV level above TAF. The Division 1 Core Spray (HV 152-F005A) and RHR (HV-151-F015A) injection valves will fail to automatically open when the low RPV pressure permissive is reached. Operator action to manually open the Division 1 Core Spray valve will be successful. The Division 1 RHR LPCI valve will trip its breaker when it is manually opened. The Division 2 RHR LPCI initiation logic will fail, requiring

manual isolation of any in service containment cooling flow paths, the second RHR pump to be manually started, and the LPCI injection valves to be manually opened. The scenario may be terminated when level has been restored to the normal band by low-pressure ECCS and RHR is being aligned to containment cooling.

Facility: **SSES Units 1 and 2** Scenario No.: **3** Op-Test No.: **LOC26**

Examiners: _____ Operators: _____

Initial Conditions: **Unit 1 33 percent power shutting down for DW RCS leak, MOL HPCI OOSVC**

Turnover: **Insert control rods, then test Turbine Bypass valve #3 RFP lube oil conditioner being swapped from A to B Control rods 42-15 and 46-19 declared slow last scram time test**

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R SRO,ATC	Insert control rods (OP-156-001, OP-AD-338)
2	N/A	N SRO,BOP	Test turbine bypass valve #3 (SO-182-001)
3	cmfHX02_ 1E102C	C SRO,BOP	FW heater 2C tube leak (AR-120-C10,D10), isolate FW heater extraction steam (ON-147-002), TS MCPR limits not applicable (TS 3.2.2)
4	cmfPM04_ 0P504C	I SRO,BOP	Diesel Generator C spurious start without cooling, manual ESW initiation required
5	cmfEB01_ 1A203 mfRR164 010	I SRO, ATC	ESS Bus 1C lockout, DW leak severity rises, reactor scram required (ON-104-203, TS 3.8.7)
6	mfRP158 003	M ALL	Electrical ATWS (EO-100-113), ARI inserts control rods
7	mfRR179 003	C ALL	Fuel failure with high MSL radiation, MSIV isolation required (AR-103-D01, AR-104-D01)
8	cmfMV06_ HV149F013	I SRO,ATC	RCIC injection valve fails to open on initiation (OP-150-001)
9	mfRC150 004	M ALL	Unisolable RCS leak into Secondary Containment, 2 areas above Max Safe radiation (EO-100-104)
10	cmfMV01_ HV149F007 cmfMV09_ HV149F008	I SRO,BOP	RCIC steam isolation valves fail to automatically close (AR-108-F04,F05), manual isolation successful after reactor pressure reduced

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Scenario Events	Actual Attributes
1. Total malfunctions (5–8)	**3,4,5,7,8,10**	**6**
2. Malfunctions after EOP entry (1–2)	**7,8,10**	**3**
3. Abnormal events (2–4)	**3,5**	**2**
4. Major transients (1–2)	**6,9**	**2**
5. EOPs entered/requiring substantive actions (1–2)	**EO-100-102 EO-100-104**	**3**
6. EOP contingencies requiring substantive actions (0–2)	**EO-100-113 EO-100-112**	**2**
7. Critical tasks (2–3) **CT-1** **Manually initiate ARI.** **CT-2** **Rapidly depressurize the reactor when two Secondary Containment Areas exceed Max Safe Rad levels.**		**2**

SCENARIO SUMMARY

The scenario begins with Unit 1 shutting down for an unplanned maintenance outage to identify and repair a small RCS leak in the Drywell, 300 days into the operating cycle. Unidentified DW leakage is steady at approximately 0.5 gpm. Reactor power is 33 percent with RFP A in-service in Flow Control Mode. HPCI is in day 2 of a 4-day unplanned maintenance window. The RFP lube oil conditioner is being placed on the RFP B reservoir after being removed from the RFP A reservoir last shift in preparation for a RFP A main lube oil pump test. Control rods 42-15 and 46-19 were declared slow during the last scram time test.

The first task for the crew is to insert control rods to lower power to approximately 30 percent. The crew will then cycle Main Turbine Bypass valve #3 per SO-182-001 to demonstrate functionality of the valve prior to scram.

When the reactivity maneuver has been completed, a tube leak will develop on the 2C Feedwater heater. The leak will initially be within the capability of the dump valve, but will continue to degrade until a heater isolation on high-high level occurs. The crew will respond to the isolation by isolating the extraction steam supplies to the 3C, 4C and 5C heaters and other inputs in accordance with off-normal procedures, and verify the high FW heater levels clear within 15 minutes or trip the main turbine.

Once the crew has completed off-normal procedures for the Feedwater heater isolation, Diesel Generator C will spuriously start. ESW Pump C will fail to automatically start and must be manually started to provide cooling to the DG. When the breaker for ESW Pump C closes, a fault in the breaker will result in an ESS Bus 1C lockout. The crew will align Instrument Air to Containment Instrument Gas to maintain AOVs in the Drywell functional. The leak in the Drywell will degrade coincident with the bus lockout, resulting in a more rapid rise in Drywell temperature and pressure. The crew should complete activities associated with the loss of ESS Bus 1C and insert a manual scram before an automatic scram on high Drywell pressure is received.

When the reactor is scrammed RPS will fail to de-energize, resulting in an electrical ATWS. When ARI is initiated, control rods will slowly drift in when ARI is initiated, resulting in significant fuel cladding failure. The Scram Discharge Volume drains will be failed open, allowing the spread of highly radioactive coolant into the CRD HCU area. This will result in radiation levels rapidly exceeding the EO 104 maximum safe values. The magnitude of the fuel failure will also result in MSL high radiation signals that will require the MSIVs to be closed.

RPV level and pressure control will be with RCIC and SRVs. The RCIC injection valve will fail to automatically open and must be manually opened. Reactor pressure may be lowered to 500-600 psig to allow Condensate to be used for reactor level control.

Once RCIC has been initiated and the CRD HCU area radiation levels have exceeded the max safe value a steam leak will develop in the RCIC room. The isolation logic will fail and both isolation valves will fail to close automatically or manually. RCIC room radiation levels will quickly rise to maximum safe levels. With radiation levels in two areas above max safe, and an unisolable primary system leak outside the primary containment, EO-104 requires Rapid Depressurization. As reactor pressure lowers, the RCIC outboard isolation valve will stroke fully closed. The scenario may be terminated when reactor level has been stabilized in the normal band with Condensate and actions to place RHR in Suppression Pool cooling have been initiated.

Facility: **SSES Units 1 and 2** Scenario No.: **5** Op-Test No.: **LOC26**

Examiners: _____ Operators: _____

Initial Conditions: **Unit 1 Mode 2, 3 percent power, 500 psig**

Turnover: **Place RFP in-service in DPM in AUTO per OP-145-001**
Control rods 42-15 and 46-19 declared slow last scram time test
Severe thunderstorm watch in effect

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N SRO,BOP	Place RFP in-service in Discharge Pressure Mode (OP-145-001)
2	N/A	R SRO,ATC	Withdraw control rods to raise reactor power (OP-AD-338, GO-100-002)
3	mfLS155 0145435	I SRO,ATC	Inoperable control rod position indication (TS 3.1.3)
4	set fx10 SULC_B9. OUT=100	I SRO,ATC	Startup level control bypass valve HV-10640 controller fails to maximum demand, take manual control (ON-145-001)
5	IMF cmfRL02_ 86A1102	C SRO,BOP	Aux Bus 11B lockout, Start Condensate Pump C to maintain 2-pump Condensate alignment with RFP in-service (ON-103-003. OP 144-001)
6	cmfFU01_ 1C618FU21	I SRO	RCIC Division 2 initiation logic power loss (TS 3.3.5.1)
7	cmfRL01_ B211K7x	C ALL	Spurious MSIV closure, insert a manual scram due to loss of the normal heat sink (ON-100-101)
8	mfMS183 007	C ALL	Drywell LOCA, place Suppression Chamber spray in-service to cool Primary Containment (OP-149-004)
9	cmfMV01_ HV151 F028x	C SRO,BOP	RHR Suppression Chamber cooling isolation valve breaker trips, place other division of RHR in Suppression Chamber spray (OP-149-004)
10	mfRH149 004x	M ALL	Unisolable Suppression Pool leak (EO-100-103, 112)

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Scenario Events	Actual Attributes
1. Total malfunctions (5–8)	**4,5,7,8,9**	**5**
2. Malfunctions after EOP entry (1–2)	**8,9**	**2**
3. Abnormal events (2–4)	**4,5**	**2**
4. Major transients (1–2)	**10**	**1**
5. EOPs entered/requiring substantive actions (1–2)	**EO-100-102 EO-100-103**	**2**
6. EOP contingencies requiring substantive actions (0–2)	**EO-100-112**	**1**
7. Critical tasks (2–3) **CT-1** **Isolate HPCI when Suppression Pool level cannot be maintained above 17 feet.** **CT-2** **Rapidly Depressurize the reactor when Suppression Pool level cannot be maintained above 12 feet.**		**2**

SCENARIO SUMMARY

The scenario begins with Unit 1 starting up from a refueling outage in Mode 2 at 500 psig, approximately 3 percent power. Control rods 42-15 and 46-19 were declared slow during the last scram time test. A severe thunderstorm watch is in effect for northeast Pennsylvania for the next 12 hours.

RFP A is in standby with RFP B in Idle. The first task for the crew is to place RFP A in-service in Discharge Pressure Mode per OP-145-001. Once the RFP is in DPM the crew will pull the next step of control rods to raise power slightly. As the crew withdraws the third control rod the PIP probe will fail, causing a loss of indication for the control rod, requiring the crew to declare it inoperable and entering TS 3.1.3.

When activities associated with TS for the inoperable PIP probe are complete, the controller for the HV 10640 will be set to 100 percent demand. The crew will respond by manually closing the HV-10640 with the controller, or controlling level with RFP A speed. If the crew elects to control speed, Maintenance will be able to take to control of the HV-10640 and ramp the valve closed to restore auto level control.

Once reactor level has been stabilized, Aux Bus 11B will experience a lockout. The crew will enter ON 103-001 for loss of the Aux Bus and ensure the unit remains stable. The crew will place Condensate Pump C in service per OP-144-001 to maintain a two Condensate Pumps in-service with a RFP in-service.

Once the crew has placed a second Condensate Pump in-service, the power to Division 2 of the RCIC initiation logic will be lost. The crew will TS 3.3.5.2 for RCIC instrumentation inoperable.

Once activities associated with Condensate Pump C and the RCIC logic power supply are complete, a spurious Group 1 MSIV and MSL drain isolation will occur. Reactor pressure will slowly begin to rise, with pressure soon exceeding the shutoff head of the Condensate Pumps. All automatic scrams are disabled. The crew should elect to conservatively insert a manual scram due to the main steam isolation. When the MSIVs stroke closed a small steam leak will develop on one of the inboard MSIVs, resulting in Drywell pressure quickly rising to the scram setpoint.

The crew will enter EO-103 for Primary Containment control and place Suppression Chamber spray in service. The first SC spray valve to be operated will fail to open and trip its breaker. The crew must shift to the other division of RHR to place in SC spray. When the 2nd RHR pump is placed in SC spray, the RHR pump motor will experience a catastrophic fault, The pump breaker will fail to open, however, resulting in a lockout of the associated ESS bus. The motor fault will result in major Suppression Pool leakage from the pump, which will be unisolable.

The Suppression Pool leakage will result in re-entry into EO-103. SP level will slowly fall until HPCI is required to be isolated. Once HPCI is isolated, the severity of the leak will rise due to flooding spreading into an adjacent compartment. Once the second room flooded alarm is in the crew should recognize that SP level cannot be maintained above 12 feet and perform a Rapid Depressurization. Low-pressure ECCS will have to be overridden when Rapid Depressurization is initiated due to the LOCA signal and the availability of Condensate to maintain reactor water level.

The scenario may be terminated when Rapid Depressurization is complete and reactor level is stable in the normal band.