Facility:	Peach Bottom ILT 13-1 2015 NRC Exam	Date of Exam:	03/23/15

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	4	3				4	3			3	20	2		5	7
	2	1	1	2				1	1			1	7	1		2	3
	Tier Totals	4	5	5				5	4			4	27	3		7	10
2. Plant Systems	1	3	2	3	2	3	2	2	3	2	2	2	26	3		2	5
	2	1	1	1	0	3	1	1	1	1	1	1	12	0	1	2	3
	Tier Totals	4	3	4	2	6	3	3	4	3	3	3	38	4		4	8

3. Generic Knowledge & Abilities Categories		1	2	3	4					
		3	3	2	2	10	1	2	3	4	7
							2	1	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

ILT 13-1 2015 NRC Exam
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#
295016 Control Room Abandonment / 7						X	2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.4	76
295020 Inadvertent Containment Isolation / 5					X		AA2.04 - Ability to determine and/or interpret the following as they apply to INADVERTENT CONTAINMENT ISOLATION :Reactor Pressure	3.9	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
295030 Low Suppression Pool Water Level / 5						X	2.2.22 – Knowledge of limiting conditins for operations and safety limits.	4.7	79
295019 Partial or Total Loss of Inst. Air / 8						X	2.1.20 - Conduct of Operations: Ability to interpret and execute procedure steps.	4.6	80
295003 Partial or Complete Loss of AC / 6						X	2.1.2 - Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.	4.4	81
295018 Partial or Total Loss of CCW / 8						X	2.1.19 - Conduct of Operations: Ability to use plant computers to evaluate system or component status.	3.8	82
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4	X						AK1.02 - Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Power/flow distribution	3.3	1
295018 Partial or Complete Loss of Component Cooling Water /8	X						AK1.01 - Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER :Effects on component/system operations	3.5	40
295031 Reactor Low Water Level / 2	X						EK1.02 - Knowledge of the operational implications of the following concepts as they apply to REACTOR LOW WATER LEVEL : Natural circulation: Plant-Specific	3.8	41
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1		X					EK2.09 - Knowledge of the interrelations between SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN and the following: Reactor water level	4.0	75
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
295024 High Drywell Pressure / 5		X					EK2.09 - Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following: Suppression pool makeup: Plant-Specific	2.9	44
295003 Partial or Complete Loss of AC / 6			X				AK3.06 - Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : Containment isolation	3.7	45
295030 Low Suppression Pool Water Level / 5			X				EK3.07 - Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: NPSH considerations for ECCS pumps	3.5	46

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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#
295019 Partial or Total Loss of Inst. Air / 8			X				AK3.02 - Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : Standby air compressor operation	3.5	47
295026 Suppression Pool High Water Temp. / 5				X			EA1.01 - Ability to operate and/or monitor the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Suppression pool cooling	4.1	48
295025 High Reactor Pressure / 3				X			EA1.04 - Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE: HPCI: Plant-Specific	3.8	49
295006 SCRAM / 1				X			AA1.04 - Ability to operate and/or monitor the following as they apply to SCRAM : Recirculation system	3.1	50
295004 Partial or Total Loss of DC Pwr / 6					X		AA2.04 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : System lineups	3.2	51
295028 High Drywell Temperature / 5					X		EA2.04 - Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE : Drywell pressure	4.1	52
295038 High Off-site Release Rate / 9					X		EA2.04 - Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE : Source of off-site release	4.1	53
295021 Loss of Shutdown Cooling / 4						X	2.1.20 – Ability to interpret and execute procedure steps.	4.6	54
600000 Plant Fire On-site / 8						X	2.4.8 - Emergency Procedures / Plan: Knowledge of how abnormal operating procedures are used in conjunction with EOP's.	3.8	55
700000 Generator Voltage and Electric Grid Disturbances						X	2.2.42 - Equipment Control:: Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	56
295023 Refueling Acc Cooling Mode / 8				X			AA1.01 - Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS : Secondary containment ventilation	3.3	57
295016 Control Room Abandonment / 7		X					AK2.03 - Knowledge of the interrelations between CONTROL ROOM ABANDONMENT and the following: Control room HVAC	2.9	58
K/A Category Totals:	3	4	3	4	3/2	3/5	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#
295035 Secondary Containment High Differential Pressure / 5					X		EA2.01 - Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: Secondary containment pressure: Plant-Specific	3.9	83
295017 High Off-site Release Rate / 9						X	2.2.12 - Equipment Control: Knowledge of surveillance procedures.	4.1	84
295015 Incomplete SCRAM / 1						X	2.1.23 – Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.4	85
295032 High Secondary Containment Area Temperature / 5	X						EK1.03 - Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Secondary containment leakage detection	3.5	59
295015 Incomplete SCRAM / 1		X					AK2.01 - Knowledge of the interrelations between INCOMPLETE SCRAM and the following: CRD hydraulics	3.8	60
295012 High Drywell Temperature / 5			X				AK3.01 - Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL TEMPERATURE : Increased drywell cooling	3.5	61
295002 Loss of Main Condenser Vacuum / 8				X			AA1.05 - Ability to operate and/or monitor the following as they apply to LOSS OF MAIN CONDENSER VACUUM :Main Turbine	3.2	62
295014 Inadvertent Reactivity Addition / 1					X		AA2.01 - Ability to determine and/or interpret the following as they apply to INADVERTENT REACTIVITY ADDITION : Reactor power	4.1	63
295029 High Suppression Pool Water Level / 5						X	2.4.31 - Emergency Procedures / Plan: Knowledge of annunciator alarms, indications, or response procedures.	4.2	64
295035 Secondary Containment High Differential Pressure / 5			X				EK3.02 - Knowledge of the reasons for the following responses as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE : Secondary containment ventilation response	3.3	65
K/A Category Totals:	1	1	2	1	1/1	1/2	Group Point Total:		7/3

ILT 13-1 2015 NRC Exam
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#
215004 Source Range Monitor								X				A2.01 - Ability to (a) predict the impacts of the following on the SOURCE RANGE MONITOR (SRM) 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	2.9	86
262002 UPS (AC/DC)								X				A2.01 - Ability to (a) predict the impacts of the following on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Under voltage	2.8	87
264000 EDGs											X	2.4.11-Knowledge of abnormal condition procedures.	4.2	88
241000 Reactor/Turbine Pressure Regulating System											X	2.1.7 –Ability to evaluate plant performance and make operational; judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.7	89
259002 Reactor Water Level Control								X				A2.02 - 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 any number of reactor feedwater flow inputs	3.4	90
259002 Reactor Water Level Control	X											K1.05 - Knowledge of the physical connections and/or cause- effect relationships between REACTOR WATER LEVEL CONTROL SYSTEM and the following: Reactor feedwater system	3.6	39
209001 LPCS	X											K1.05 - Knowledge of the physical connections and/or cause- effect relationships between LOW PRESSURE CORE SPRAY SYSTEM and the following: Automatic depressurization system	3.7	2
203000 RHR/LPCI: Injection Mode		X										K2.01 - Knowledge of electrical power supplies to the following: Pumps	3.5	3
400000 Component Cooling Water		X										K2.02 - Knowledge of electrical power supplies to the following: CCW valves	2.9	4

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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#
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	5
223002 PCIS/Nuclear Steam Supply Shutoff			X									K3.12 - Knowledge of the effect that a loss or malfunction of the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF will have on following: High pressure coolant injection: Plant-Specific	3.6	6
264000 EDGs				X								K4.08 - Knowledge of EMERGENCY GENERATORS (DIESEL/JET) design feature(s) and/or interlocks which provide for the following: Automatic startup	3.8	7
218000 ADS				X								K4.01 - Knowledge of AUTOMATIC DEPRESSURIZATION SYSTEM design feature(s) and/or interlocks which provide for the following: Prevent inadvertent initiatior of ADS logic	3.7	8
215005 APRM / LPRM					X							K5.05 - Knowledge of the operational implications of the following concepts as they apply to AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM : Core flow effects on APRM trip setpoints	3.6	9
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	3.1	10
215003 IRM						X						K6.01 - Knowledge of the effect that a loss or malfunction of the following will have on the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM : Reactor protection system (power supply): Plant-Specific	3.8	11
211000 SLC						X						K6.03 - Knowledge of the effect that a loss or malfunction of the following will have on the STANDBY LIQUID CONTROL SYSTEM : A.C. power	3.2	12
209001 LPCS							X					A1.04 - Ability to predict and/or monitor changes in parameters associated with operating the LOW PRESSURE CORE SPRAY SYSTEM controls including: Reactor pressure	3.7	13

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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#
218000 ADS							X					A1.06 - Ability to predict and/or monitor changes in parameters associated with operating the AUTOMATIC DEPRESSURIZATION SYSTEM controls including: Suppression pool temperature	4.1	14
206000 HPCI								X				A2.04 - 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: A.C. failures: BWR-2,3,4	2.7	15
217000 RCIC								X				A2.10 - Ability to (a) predict the impacts of the following on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Turbine control system failures	3.1	16
239002 SRVs									X			A3.02 - Ability to monitor automatic operations of the RELIEF/SAFETY VALVES including: SRV operation on high reactor pressure	4.3	17
261000 SGTS									X			A3.03 - Ability to monitor automatic operations of the STANDBY GAS TREATMENT SYSTEM including: Valve operation	3.0	18
212000 RPS										X		A4.14 - Ability to manually operate and/or monitor in the control room: Reset system following system activation	3.8	19
215004 Source Range Monitor										X		A4.03 - Ability to manually operate and/or monitor in the control room: CRT displays: Plant-Specific	2.9	20
300000 Instrument Air											X	2.4.31 – Knowledge of annunciator alarms, indications, or response procedures.	4.2	21
263000 DC Electrical Distribution											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.	4.0	22

ILT 13-1 2015 NRC Exam
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#
205000 Shutdown Cooling					X							K5.03 - Knowledge of the operational implications of the following concepts as they apply to SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) : Heat removal mechanisms	2.8	23
215004 Source Range Monitor			X									K3.01 - Knowledge of the effect that a loss or malfunction of the SOURCE RANGE MONITOR (SRM) SYSTEM will have on following: RPS	3.4	24
261000 SGTS								X				A2.06 - Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Valve Closure	2.9	25
217000 RCIC	X											K1.03 - Knowledge of the physical connections and/or cause- effect relationships between REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) and the following: Suppression pool	3.6	26
K/A Category Totals:	3	2	3	2	3	2	2	3/3	2	2	2/2	Group Point Total:	26/5	

ILT 13-1 2015 NRC Exam
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	A2	A 3	A 4	G		Imp.	Q#
215001 Traversing In-core Probe								X				A2.08 - 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 to shield: (Not-BWR1)	2.9	91
202002 Recirculation Flow Control											X	2.2.40 –Ability to apply Technical Specifications for a system.	4.7	92
233000 Fuel Pool Cooling/Cleanup											X	2.2.22 - Equipment Control: Knowledge of limiting conditions for operations and safety limits.	4.7	93
215002 RBM	X											K1.06 - Knowledge of the physical connections and/or cause- effect relationships between ROD BLOCK MONITOR SYSTEM and the following: Control rod selection: BWR-3,4,5	3.0	27
272000 Radiation Monitoring		X										K2.01 - Knowledge of electrical power supplies to the following: Main steamline radiation monitors	2.5	28
256000 Reactor Condensate			X									K3.08 - Knowledge of the effect that a loss or malfunction of the REACTOR CONDENSATE SYSTEM will have on following: SJAE	2.8	29
290001 Secondary CTMT					X							K5.01 - Knowledge of the operational implications of the following concepts as they apply to SECONDARY CONTAINMENT: Vacuum breaker operation	3.3	30
268000 Radwaste					X							K5.01 - Knowledge of the operational implications of the following concepts as they apply to RADWASTE : Units of radiation, dose and dose rate	2.7	31
239001Main and Reheat Steam System						X						K6.02 - Knowledge of the effect that a loss or malfunction of the following will have on the MAIN AND REHEAT STEAM SYSTEM : Plant air system	3.2	32
204000 RWCU							X					A1.07 - Ability to predict and/or monitor changes in parameters associated with operating the REACTOR WATER CLEANUP SYSTEM controls including: RWCU drain flow	2.9	33
230000 RHR/LPCI: Torus/Pool Spray Mode								X				A2.14 - Ability to (a) predict the impacts of the following on the RHR/LPCI: TORUS/SUPPRESSION POOL SPRAY MODE ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low (or negative) suppression pool pressure during system operation	3.2	34

ILT 13-1 2015 NRC Exam
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	A2	A 3	A 4	G		Imp.	Q#
233000 Fuel Pool Cooling/Cleanup									X			A3.03 - Ability to monitor automatic operations of the FUEL POOL COOLING AND CLEAN-UP including: System indicating lights and alarms	2.6	35
201002 RMCS										X		A4.02 - Ability to manually operate and/or monitor in the control room: Emergency in/notch override switch	3.5	36
259001 Reactor Feedwater											X	2.1.31 – Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.	4.6	37
202001 Recirculation					X							K5.01 - Knowledge of the operational implications of the following concepts as they apply to RECIRCULATION SYSTEM : Indications of pump cavitation	2.7	38
K/A Category Totals:	1	1	1	0	3	1	1	1/1	1	1	1/2	Group Point Total:		12/3

Facility:	ILT 13-1 2015 NRC Exam	Date:	03/23/15			
Category	K/A #	Topic	RO		SRO-Only	
			IR	Q#	IR	Q#
1. Conduct of Operations	2.1.41	Knowledge of the refueling process.			3.7	94
	2.1.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.			4.2	99
	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	4.1	66		
	2.1.29	Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.	4.1	67		
	2.1.3	Knowledge of shift or short-term relief turnover practices.	3.7	42		
	Subtotal			3		2
2. Equipment Control	2.2.15	Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc.			4.3	95
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	4.0	68		
	2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	4.5	69		
	2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	4.5	74		
	Subtotal			3		1
3. Radiation Control	2.3.11	Ability to control radiation releases.			4.3	96
	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.			3.8	98
	2.3.5	Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personell monitoring equipment, etc.	2.9	70		
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	71		

	Subtotal			2		2

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Category	K/A #	Topic	RO		SRO-Only	
			IR	Q#	IR	Q#
4. Emergency Procedures / Plan	2.4.18	Knowledge of the specific bases for EOPs.			4.0	97
	2.4.50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.			4.0	100
	2.4.30	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.	2.7	72		
	2.4.14	Knowledge of general guidelines for EOP usage.	3.8	73		
	Subtotal			2		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO 2/1 Q # 10	262001K5.01	This K/A overlapped with the operating test. Replaced with K/A 262001 K5.02
RO 2 / 1 Q #21	300000 / 2.4.41	EAL classification task for an RO question. Replaced with K/A 300000 2.4.31.
RO 2/1 Q # 25	261000 / A2.04	Could not a satisfactory question to the original K/A of impact of high moisture content and procedure to correct or mitigate. Replaced with K/A 261000 A2.06.
RO 2 / 2 Q #30	290001 / K4.01	Could not develop a question above General Employee Training for this K/A. Replaced with K/A 290001 K5.01.
RO 2 / 2 Q #32	201004 / K6.02	Software sampled RSCS. RSCS is no longer a PBAPS system. Replaced with K/A 239001 K6.02.
RO 2 / 2 Q #37	259001 2.1.19	Could not a satisfactory question linking the process computer to the feedwater system. Replaced with K/A 259001 2.1.31
RO 1 / 1 Q #40	295028 / AK1.01	295028 was oversampled. Replaced with K/A 295018 AK1.01.
RO 1 / 1 Q #54	295021 2.1.19	G 2.1.19 had been selected three times. Replaced with K/A 295021 2.1.20.
RO 1 / 2 Q #59	295032 EK1.02	Could not write a satisfactory question linking Radiation release to High Secondary Containment area temperatures. Replaced with K/A 295032 EK1.03.
RO 1 / 2 Q #62	295034 / AA1.05	Too many similar K/A for Secondary Containment selected. Replaced with K/A 295002 AA1.05
RO 3 Q #67	2.1.27	Could not a tier 3 question matching the system purpose. Replaced with K/A 2.1.29
RO 3 Q #68	2.2.7	Not an RO task. Replaced with K/A 2.2.22
RO 3 Q #69	2.2.20	Not an RO task. Replaced with K/A 2.2.1
SRO 1 / 1 Q # 76	295016 / AA2.05	Could not make a SRO question linking the K/A. Replaced with K/A 295016 2.1.23.
SRO 1 / 1 Q #77	295004 / AA2.04	Same K/A selected for Q #51. Replaced with K/A 295020 AA2.04.
SRO 1 / 1 Q #79	295030 / 2.2.39	Could not develop a SRO question. Replaced with K/A 295030 2.2.22.
SRO 1 / 2 Q #85	295015 / 2.1.28	Not a SRO task. Could not develop a SRO question. Replaced with K/A 295015 2.1.23.
SRO 2 / 1 Q #88	264000 / 2.4.4	No EOP entry conditions bases on Emergency Diesel Generators. Replaced with K/A 26400 2.4.11.
SRO 2 / 1 Q #89	217000 2.1.14	217000 was already sampled twice. 2.1.14 is not an SRO task. Replaced with K/A 241000 2.1.7.
SRO 2 / 2	202002 / 2.2.39	Not a SRO task. Could not develop a SRO question.

Q #92		Replaced with K/A 202002 2.2.40.
SRO 3 Q #98	2.3.6	Could not develop a SRO question. Replaced with 2.3.13.

Facility: Peach Bottom Date of Examination: 03/23/2015

Examination Level: RO ☒ SRO ☐ Operating Test Number: 2015 NRC

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, P, R	G2.1.45 (4.3) - Manually Calculate Drywell Bulk Average Temperature with Failed Temperature Points (PLOR-241C) (2011 NRC)
Conduct of Operations	D, S	G2.1.31 (4.6) - Perform an APRM Scram Margin Check (PLOR-219C)
Equipment Control	D, R	G2.2.41 (3.5) - Determine Status of Instrument Nitrogen Compressor Discharge Solenoid Valve Using Station Piping and Instrumentation Drawings (PLOR-220C)
Radiation Control	N/A	Not Required
Emergency Plan	N, R	G2.4.29 (3.1) - Emergency Response Organization Response Augmentation Using the Everbridge Web-based Call Out System (PLOR-92C)

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

* Type Codes & Criteria:
(C)ontrol room, (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)

Facility: Peach Bottom Date of Examination: 03/23/2015

Examination Level: RO ☐ SRO ☒ Operating Test Number: 2015 NRC

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, R	G2.1.7 (4.7) - Resolution of Thermal Limit Violation (PLOR-218C)
Conduct of Operations	D, R	G2.1.5 (3.9) - Evaluate Overtime Work Request (PLOR-279C)
Equipment Control	M, R	G2.2.6 (3.6) - Review a Temporary Procedure Change - Change of Intent (PLOR-222C)
Radiation Control	D, P, R	G2.3.13 (3.8) - Perform Primary Containment Purge / Vent Isolation Valve Cumulative Log (PLOR-256C) (2013 NRC)
Emergency Plan	N, R	G2.4.41 (4.6) - Make EAL Classification And State/Local Notifications for ALERT - Inability to Maintain Cold Shutdown (PLOR-153C)

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

* Type Codes & Criteria:
(C)ontrol room, (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)

Facility: Peach Bottom Date of Examination: 03/23/2015

Exam Level: RO ☒ SRO-I ☐ SRO-U ☐ Operating Test Number: 2015 NRC

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
a. 295001 AA1.06 (3.3/3.4) - Reactor Operator Actions on a Recirculation Pump Trip (Alternate Path - Thermal Hydraulic Instability Exists Without Operable OPRM System)(PLOR-374CA)	A, N, S	1
b. 206000 A3.07 (3.9/3.8) - Startup HPCI in the CST to CST Mode (Alternate Path - Turbine Exhaust Diaphragm High Pressure) (PLOR-353CA) 2011 NRC Exam	A, D, EN, P,S	2
c. 203000 A4.02 (4.1/4.1) Manual Startup of LPCI for Injection (Alternate Path – RHR Injection Valve Trips on Thermal Overload) (PLOR-381CA)	A, EN, N, S	4
d. 223001 A2.07 (4.2/4.3) – Drywell Venting via the 2 Inch Vents (Alternate Path – Main Stack High Radiation) (PLOR-321CA)	A, D, S	5
e. 264000 A4.04 (3.7/3.7) – Load Diesel Generator to 500kW (Alternate Path – Differential/Ground Fault) (PLOR-373CA)	A, N, S	6
f. 201006 A3.01 (3.2/3.1) - Initialize the Rod Worth Minimizer (PLOR-366C)	D, L, S	7
g. 400000 A4.01 (3.1/3.0) - ECW System Makeup to Emergency Cooling Tower Using ESW System (PLOR-270C) 2011 NRC Exam	D, EN, P, S	8
h. 295017 AA1.09 (3.6/3.8) - Manually Place Standby Gas Treatment System on Equipment Cell Exhaust (PLOR-18C)	D, EN, S	9
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. 295031 EA1.08 (3.8/3.9) – Alternate RPV Injection Using the Standby Liquid Control Test Tank (PLOR-105P)	D, E, R	2
j. 206000 K1.01 (3.8/3.9) - RPV Venting During Containment Flooding (PLOR-93P)	D, E, L, R	4
k. 295018 AA1.01 (3.3/3.4) – Loss of RBCCW (Plant Actions for the Instrument Nitrogen System) (PLOR-96P) 2011 NRC Exam	D, P, R	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	≤ 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	

Facility: Peach Bottom Date of Examination: 03/23/2015

Exam Level: RO ☐ SRO-I ☒ SRO-U ☐ Operating Test Number: 2015 NRC

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
a. 295001 AA1.06 (3.3/3.4) - Reactor Operator Actions on a Recirculation Pump Trip (Alternate Path - Thermal Hydraulic Instability Exists Without Operable OPRM System)(PLOR-374CA)	A, N, S	1
b. 206000 A3.07 (3.9/3.8) - Startup HPCI in the CST to CST Mode (Alternate Path - Turbine Exhaust Diaphragm High Pressure) (PLOR-353CA) 2011 NRC Exam	A, D, EN, P,S	2
c. 203000 A4.02 (4.1/4.1) Manual Startup of LPCI for Injection (Alternate Path – RHR Injection Valve Trips on Thermal Overload)(PLOR-381CA)	A, EN, N, S	4
d. 223001 A2.07 (4.2/4.3) – Drywell Venting via the 2 Inch Vents (Alternate Path – Main Stack High Radiation) (PLOR-321CA)	A, D, S	5
e. 264000 A4.04 (3.7/3.7) – Load Diesel Generator to 500kW (Alternate Path – Differential/Ground Fault) (PLOR-373CA)	A, N, S	6
f.		
g. 400000 A4.01 (3.1/3.0) - ECW System Makeup to Emergency Cooling Tower Using ESW System (PLOR-270C) 2011 NRC Exam	D, EN, P, S	8
h. 295017 AA1.09 (3.6/3.8) - Manually Place Standby Gas Treatment System on Equipment Cell Exhaust (PLOR-18C)	D, EN, S	9

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

i. 295031 EA1.08 (3.8/3.9) – Alternate RPV Injection Using the Standby Liquid Control Test Tank (PLOR-105P)	D, E, R	2
j. 206000 K1.01 (3.8/3.9) - RPV Venting During Containment Flooding (PLOR-93P)	D, E, L, R	4
k. 295018 AA1.01 (3.3/3.4) – Loss of RBCCW (Plant Actions for the Instrument Nitrogen System) (PLOR-96P) 2011 NRC Exam	D, P, R	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.

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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	

Facility: Peach Bottom | Date of Examination: 03/23/2015

Exam Level: RO ☐ SRO-I ☐ SRO-U ☒ | Operating Test Number: 2015 NRC

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. 295001 AA1.06 (3.3/3.4) - Reactor Operator Actions on a Recirculation Pump Trip (Alternate Path - Thermal Hydraulic Instability Exists Without Operable OPRM System)(PLOR-374CA)	A, N, S	1
b. 206000 A3.07 (3.9/3.8) - Startup HPCI in the CST to CST Mode (Alternate Path - Turbine Exhaust Diaphragm High Pressure) (PLOR-353CA) 2011 NRC Exam	A, D, EN, P,S	2
c.		
d.		
e.		
f.		
g.		
h. 295017 AA1.09 (3.6/3.8) - Manually Place Standby Gas Treatment System on Equipment Cell Exhaust (PLOR-18C)	D, EN, S	9
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i.		
j. 206000 K1.01 (3.8/3.9) - RPV Venting During Containment Flooding (PLOR-93P)	D, E, L, R	4
k. 295018 AA1.01 (3.3/3.4) – Loss of RBCCW (Plant Actions for the Instrument Nitrogen System) (PLOR-96P) 2011 NRC Exam	D, P, R	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	≤ 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	

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO 2 / 1 Q #21	300000 / 2.4.41	EAL classification task for an RO question. Replaced with K/A 300000 2.4.31.
RO 2 / 2 Q #30	290001 / K4.01	Could not develop a question above General Employee Training for this K/A. Replaced with K/A 290001 K5.01.
RO 2 / 2 Q #32	201004 / K6.02	Software sampled RSCS. RSCS is no longer a PBAPS system. Replaced with K/A 239001 K6.02.
RO 1 / 1 Q #40	295028 / AK1.01	295028 was oversampled. Replaced with K/A 295018 AK1.01.
RO 1 / 1 Q #54	295021 2.1.19	G 2.1.19 had been selected three times. Replaced with K/A 295021 2.1.20.
RO 1 / 2 Q #62	295034 / AA1.05	Too many similar K/A for Secondary Containment selected. Replaced with K/A 295002 AA1.05
SRO 1 / 1 Q # 76	295016 / AA2.05	Could not make a SRO question linking the K/A. Replaced with K/A 295016 2.1.23.
SRO 1 / 1 Q #77	295004 / AA2.04	Same K/A selected for Q #51. Replaced with K/A 295020 AA2.04.
SRO 1 / 1 Q #79	295030 / 2.2.39	Could not develop a SRO question. Replaced with K/A 295030 2.2.22.
SRO 1 / 2 Q #85	295015 / 2.1.28	Not a SRO task. Could not develop a SRO question. Replaced with K/A 295015 2.1.23.
SRO 2 / 1 Q #88	264000 / 2.4.4	No EOP entry conditions bases on Emergency Diesel Generators. Replaced with K/A 26400 2.4.11.
SRO 2 / 1 Q #89	217000 2.1.14	217000 was already sampled twice. 2.1.14 is not an SRO task. Replaced with K/A 241000 2.1.7.
SRO 2 / 2 Q #92	202002 / 2.2.39	Not a SRO task. Could not develop a SRO question. Replaced with K/A 202002 2.2.40.
SRO 3 Q #98	2.3.6	Could not develop a SRO question. Replaced with 2.3.13.

Simulation Facility Peach Bottom **Scenario No.** #1 **Op Test No.** 2015 NRC

Examiners _____ **Operator** _____ CRS (SRO)

_____ _____ URO (ATC)

_____ _____ PRO (BOP)

Scenario Summary The scenario begins with the reactor at approximately 3% power during a reactor startup.

Following shift turnover, the PRO will secure the Drywell Purge lineup.

A Primary Containment Isolation valve will fail open. The failed valve will require the CRS to evaluate the situation in Tech Specs and determine that the penetration must be isolated within four hours.

The URO will continue the startup by raising reactor power to > 4% by withdrawing control rods in accordance with the approved startup sequence until 3 main turbine bypass valves are open with reactor pressure at 915 psig using procedure GP-2-2, "Normal Plant Startup".

A control rod will become mispositioned due to a Reactor Manual Control System timer failure, requiring the crew to execute ON-122, "Mispositioned Control Rod" to return the control rod to the correct target position.

Following the mispositioned Control Rod, the steam supply valve for the in-service Steam Jet Air Ejector fails closed due to a loss of its normal air supply. The loss of steam to the air ejector will cause main condenser vacuum to get worse. The crew should recognize the lowering vacuum condition and enter procedure OT-106 "Condenser Low Vacuum". The CRS should direct the crew to place the steam supply valve alternate air supply in service and restore the air ejector to normal service and thereby reestablishing normal main condenser vacuum. The CRS might direct the PRO to swap Air Ejectors using SO 8A.6.A-2, "Placing the Standby SJAE In Service and Placing the In-Service SJAE in Standby".

Once main condenser vacuum is normal there will be a spurious start of the "A" loop of Core Spray. Following the spurious start a leak will occur in the "A" Core Spray pump discharge piping. The leak will continue until the Crew secures the pumps and isolated the suction for the "A" Core Spray pump. The CRS should reference Technical Specifications for required actions with the "A" Core Spray pump inoperable.

When the CRS has determined the Tech Spec action, the startup level control system will experience a control signal failure resulting in the startup level control valve failing closed. The valve closure will halt any makeup to the RPV and subsequently RPV level will lower. The crew should recognize the lowering RPV level and enter procedure OT-100 "Reactor Level Low". Placing the startup level control valve controller into manual will not return control of the makeup valve. The URO will need to establish RPV level control using the "C" RFP discharge valve and RFP speed.

Once RPV level is stabilized, a steam leak will develop in the primary containment with a stuck open Torus to Drywell vacuum breaker. The crew should recognize the rise in drywell temperature and pressure and enter procedure OT-101 "High Drywell Pressure". OT-101 actions include maximizing drywell cooling and isolating steam supply valves in the drywell in order to identify the possible leak location. When drywell pressure reaches 1.2 psig the crew should attempt to scram the reactor. When the mode switch is placed in shutdown no control rods will insert due to an electric ATWS. The crew should enter procedure T-101 "RPV Control" to respond to the ATWS condition. The control rods will fully insert and the ATWS will be terminated when Alternate Rod Insertion is initiated using Rapid Response Card RRC 3B.1-2 "ARI During a Plant Event". **(Critical Task; Insert all control rods using ARI)**

When drywell pressure reaches 2 psig the crew will enter procedure T-102 "Primary Containment Control" to respond to the degrading condition. The crew should spray the primary containment using procedure T-204 "Initiation of Containment Sprays Using RHR" to maintain below the Pressure Suppression Pressure Limit. **(Critical Task; Spray the Drywell before the Pressure Suppression Pressure Limit Curve is exceeded)** When Drywell Sprays are placed in-service, the RHR pump will trip and another RHR will need to be placed in-service. The scenario will be terminated when Primary Containment pressure is stable due to spraying containment.

Initial Conditions IC-71 Approximately 3% power

Turnover Unit 2 startup is in progress.
Drywell purge needs to be secured. The extra RO will begin inerting Containment shortly after turnover.
Reactor Power is approximately 3% with direction to continue to raise Reactor power with control rods using GP-2-2

Event No.	Malfunction No.	Event Type*	Event Description
1	See Scenario Guide	N PRO CRS	Secure the Drywell Purge Lineup
2	See Scenario Guide	TS CRS	Failure of a Primary Containment isolation valve
3	See Scenario Guide	R URO CRS	Raise reactor power by withdrawing control rods until 2 main turbine bypass valves are open with reactor pressure at 915 psig
4	See Scenario Guide	C URO CRS	A control rod becomes mispositioned, requiring execution of ON-122 "Mispositioned Control Rod"
5	See Scenario Guide	C PRO CRS	Steam supply valve for in-service Steam Jet Air Ejector fails closed / lowering main condenser vacuum
6	See Scenario Guide	C TS PRO CRS	"A" Core Spray loop spurious start. "A" Core Spray suction line break/flooding (Tech Spec)
7	See Scenario Guide	C URO CRS	Startup level control valve fails closed / lowering RPV level
8	See Scenario Guide	M ALL	Reactor coolant leak inside the drywell / Torus to Drywell vacuum breaker fails open
9	See Scenario Guide	C URO CRS	ATWS / Control rods inserted using Alternate Rod Insertion
10	See Scenario Guide	C PRO CRS	RHR pump running in Torus Spray trips

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

Simulation Facility Peach Bottom **Scenario No.** #2 **Op Test No.** NRC

Examiners _____ **Operator** _____ CRS (SRO)

_____ _____ URO (ATC)

_____ _____ PRO (BOP)

Scenario Summary

The scenario begins with the reactor at 100% power with the 'B' Electrohydraulic Control (EHC) pump and the E-332 breaker are blocked out of service for scheduled maintenance.

After taking the shift, the Crew will perform the Master Trip Solenoid Valve Routine Test RT-O-01D-402-2.

Shortly after this, the E-4 diesel generator will inadvertently start, requiring the Crew to shut down the E-4 diesel generator from the main control room and apply Technical Specifications for an inoperable diesel generator.

Following the diesel generator inoperability there will be a loss of the 250 VDC bus that supplies power to the RCIC system. The Crew must recognize the loss of DC power and apply Technical Specifications for the inoperable DC power supply.

Following the 250 VDC bus inoperability, the in-service Turbine Building Closed Cooling Water (TBCCW) pump trips on overload and the standby TBCCW pump fails to automatically start. The Crew should place the standby pump in service by placing its control switch to start and monitor the system pressure and temperature.

Shortly after the TBCCW system is restored the Crew should recognize and respond to lowering main condenser vacuum caused by air in-leakage. The Crew will be able to stabilize the plant with the existing air in-leakage by entering OT-106 "Condenser Low Vacuum" and reducing reactor power in accordance with GP-9-2 "Fast Power Reduction". During the power reduction a reactor feed pump will not automatically respond requiring the Crew to take manual control and reduce feed pump flow to avoid a main turbine trip on high reactor water level.

Following the power reduction, a high vibration condition for the main turbine will occur, requiring the Crew to scram the reactor and trip the main turbine. A CRD hydraulic malfunction will result in an ATWS, requiring the Crew to execute T-101 "RPV Control" and T-117 "Level/Power Control."

A failure of the only available EHC pump will cause the turbine bypass valves to close, requiring the Crew to utilize SRVs for reactor pressure control. The Crew should perform T-220 "Driving Control Rods During Failure to Scram" and T-216 "Control Rod Insertion by Manual Scram or Individual Scram Test Switches" to insert control rods. **(Critical Task; Attempt to shutdown the reactor by performing one or more of the following: T-216 "Control Rod Insertion by Manual Scram or Individual Scram Test Switches", T-220 "Driving Control Rods During Failure to Scram", T-246, "Maximizing CRD Flow to the Reactor Vessel", "Initiating Standby Liquid Control before Torus temperature**

exceeds 110^{0}F"). The scenario may be terminated when the Crew has control of RPV power and level using T-240 "Termination and Prevention of Injection into the RPV" and the Crew is inserting control rods. **(Critical Task; Before violating the Heat Capacity Temperature Limit (HCTL) curve,, perform T-240 "Terminating and Preventing Injection Into the RPV" to protect Primary Containment until: Reactor power is below 4% or RPV level reaches -172 inches or All SRVs remain closed and Drywell pressure is below 2 psig.)**

Initial IC-14, 100% power

Conditions Turnover Reactor power is 100% power.

'B' Electrohydraulic Control (EHC) pump blocked out of service for scheduled maintenance.

E-332 breaker is blocked out of service for scheduled maintenance.

Perform the Master Trip Solenoid Valve Routine Test RT-O-01D-402-2.

Event No.	Malfunction No.	Event Type*	Event Description
1	See Scenario Guide	N PRO CRS	Perform the master trip solenoid valve routine test
2	See Scenario Guide	I PRO TS CRS	E4 diesel generator spurious start / diesel generator manual shutdown (Tech Spec)
3	See Scenario Guide	TS CRS	Loss of 250 VDC bus / RCIC becomes unavailable (Tech Spec)
4	See Scenario Guide	C PRO CRS	In service Turbine Building Closed Cooling Water (TBCCW) pump trips on overload / Failure of standby TBCCW pump to automatically start
5	See Scenario Guide	R URO	Main condenser air in-leakage causes lowering condenser vacuum / GP-9 fast power reduction (with Recirc)
6	See Scenario Guide	C URO	Reactor feed pump does not respond to lowering power change / must place in manual to control
7	See Scenario Guide	C URO CRS	Main turbine high vibration / reactor scram
8	See Scenario Guide	M ALL	ATWS (hydraulic)
9	See Scenario Guide	C PRO	Remaining EHC pump trips causing loss of main turbine bypass valves / control reactor pressure with HPCI and/or SRVs

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

Simulation Facility Peach Bottom **Scenario No.** #4 **Op Test No.** 2015 NRC

Examiners _____ **Operator** _____ CRS (SRO)

_____ _____ URO (ATC)

_____ _____ PRO (BOP)

Scenario Summary

The scenario begins with the reactor at 100% power with the 'B' Emergency Service Water (ESW) Pump in service for an evaluation of flow through the Emergency Diesel Generator heat exchangers.

Shortly after taking the shift the Crew will swap Electrohydraulic Control (EHC) Pumps using procedure SO 1D.6.A-2 "Placing the EHC Oil System Standby Pump in Service". The 'B' EHC pump will be started and the 'A' EHC pump will be shut down.

Once the "B" EHC pump is in service, an Equipment Operator will report a Core Spray snubber is INOP. The CRS will review the TRM and Tech Spec and determine that the Core Spray loop is INOP.

After the Tech Spec determination is made, a high temperature condition will occur on the in-service RWCU pump. With the standby pump out of service the Crew will be required to remove the RWCU system from service.

After the RWCU system is removed from service a leak will develop on the discharge of the running 'B' ESW Pump requiring the Crew to recognize the condition and secure the 'B' ESW pump. The CRS should reference Technical Specifications for the inoperable ESW pump and also for inoperable fire barriers due to doors being intentionally left open in response to the flooding.

Once the Technical Specification determinations have been made, the running RBCCW pump will trip and the standby pump will fail to start, resulting in a complete loss of RBCCW. The Crew should reduce reactor power as directed by ON-113 "Loss of RBCCW." The Crew should reduce power using procedure GP-9 "Fast Power Reduction". As a result of the loss of RBCCW the 'B' Recirculation Pump will experience a mechanical seal failure which is the source of a steam leak into the primary containment. The Crew should enter procedure OT-101 "Drywell High Pressure". Temperatures on the recirculation pump will rise requiring the Crew to remove the pump from service and they should enter procedure OT-112 "Unexpected/Unexplained Change in Core Flow". When primary containment pressure reaches 1.2 psig the Crew will shut down the reactor using procedure GP-4 "Scram". When the Crew places the mode switch in shut down the control rods will not insert due to a failure of the reactor mode switch. Depressing the manual scram pushbuttons will insert the control rods. **(Critical Task; Shutdown the Reactor by depressing the Manual Scram Pushbuttons.)**

The steam leak worsens. The Crew should execute proceduresT-101 "RPV Control" and T-102 "Primary Containment Control". The Crew should spray the primary containment using procedure T-204 "Initiation of Containment Sprays

Using RHR". **(Critical Task; Spray the Drywell to (restore and) maintain Drywell Bulk Average Temperature below 281^{0}F.)** A Drywell Chilled Water system to RBCCW system leak will develop allowing steam to leak into the RBCCW Room outside of the primary containment. The Crew will need to isolate the RBCCW system using procedure GP-8.B "PCIS Isolation – Groups 2 and 3". **(Critical Task; Isolate RBCCW from the Drywell in the Control Room.)**

The scenario may be terminated when the reactor is shut down with RPV level is under control, Primary Containment sprays are in service, and the RBCCW leak is isolated.

Initial Conditions IC-14, 100% power

Turnover Unit 2 is at 100% power.
"B" RWCU pump is out of service.
There is a leak in the RBCCW system that requires the head tank to be filled every 12 hours. The head tank was last filled 6 hours ago.
The "B" ESW pump is in-service to do a flow evaluation of flow through the D/G heat exchangers. The test is expected to be completed within the hour.
Following turnover the PRO will be directed to place the "B" EHC pump in-service and secure the "A" EHC pump.

Event No.	Malfunction No.	Event Type*	Event Description
1	See Scenario Guide	N PRO CRS	Swap EHC Pumps
2	See Scenario Guide	TS CRS	INOP Core Spray pump discharge snubber
3	See Scenario Guide	C PRO CRS	RWCU pump motor high winding temperature, secure RWCU.
4	See Scenario Guide	C PRO TS CRS	'B' ESW Room flood / secure the 'B' ESW Pump (Tech Spec)
5	See Scenario Guide	R URO CRS	Loss of RBCCW / fast reactor power reduction (w/ recirc and rods)
6	See Scenario Guide	C URO CRS	'B' Recirculation Pump seal failure / Steam leak in primary containment
7	See Scenario Guide	C URO CRS	Failure of the Recirc suction valve "MO-2-02-043B" to close
8	See Scenario Guide	I URO CRS	Failure to automatically scram (manual scram pushbuttons are required to scram the reactor)
9	See Scenario Guide	M ALL	Steam leak worsens
10	See Scenario Guide	M ALL	Drywell to RBCCW leak / Steam leak in RBCCW Room outside of primary containment

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

Peach Bottom 2015 NRC Initial License Exam

Changes Made to JPMs Since Initial Submittal

JPM	Change(s)
CR-a Reactor Operator Actions on a Recirc Pump Trip – Alt Path, THI Exists with Inoperable OPRM System	This JPM was heavily modified to make the Examinee believe that the JPM task is to lockup the Scoop Tube for the 2A Reactor Recirculation Pump M-G Set. Once the JPM begins, then the Examinee receives alarm indication and cueing that is expected to drive the Examinee to trip the 2A Reactor Recirculation Pump M-G Set. Once tripped, Thermal Hydraulic Instability will occur driving the Examinee to scram the reactor. Specific changes include: 1. Task Conditions/Prerequisites cue sheet was updated to have the Examinee prepare to lockup the Scoop Tube for the 2A Reactor Recirculation Pump M-G Set. 2. Added new steps #2, #3, and #4 (ALL CRITICAL) related to the Examinee having to determine that the 2A RRP must be removed from service due to high motor bearing temperatures. 3. Bolded cue in steps 9 and 13 since it is required for JPM to progress.
CR-b Startup HPCI in CST to CST Mode – Alt path, Turbine Exhaust Diaphragm High Pressure	This JPM was heavily modified to remove all references to shutting down the HPCI system using normal operating procedure SO 23.1-2 "HPCI System Shutdown" since we are expecting the candidate to shutdown the system using either 1) the Alarm Response Card for the abnormal condition (immediately trip the turbine) or 2) the Rapid Response Card that is directed in the initiating cue. Specific changes include: 1. Removed normal operating procedure SO 23.1-2 "HPCI System Shutdown" from the list of references. 2. Added two new Task Condition /Prerequisites to state that RPV level is normal and steady, and that primary containment pressure is also normal and steady. This is information that the Candidate will need to determine that there are NO HPCI initiation signals present. 3. Deleted extra period in name for MO-2-23-24 in steps #2 and #3. 4. Added HPCI system flow controller FIC-2-23-108 operation to step 12. 5. Added new NOTE after step 13 to describe 2 possible procedural flow paths for securing HPCI. 6. Steps 14 through 27 are now the steps out of RRC 23.1-2, Section F "HPCI Shutdown with NO Initiation Signal Present" that are expected to be used by the Candidate
CR-c Manual Startup of LPCI for Injection – Alt Path, Injection Valve Trips	1. Bolded cue in steps 16 and 19 since it is required for JPM to progress. 2. Added "and down slow" to RPV level trend in Task Conditions/Prerequisites. 3. Corrected misaligned Initiating Cue on Cue Sheet 4. All motor operated valve number designators were updated with formal valve number (i.e. MO-25A is now MO-2-10-25A).

JPM	Change(s)
CR-d Drywell Venting via the 2" Vent – Alt Path	1. Initial Condition setup to support a Drywell pressure of 1 psig. 2. Modified Simulator Operator setup page to raise indication on both the A and B Main Stack Gas Recorders to reflect rising Main Stack high radiation levels during venting.
CR-e Load EDG to 500 KW – Alt Path, Differential Ground	1. Fixed numbering mistakes on page 3 of 9. 2. Modified Simulator Operator setup page to bring in additional alarm for E-42 bus fault at the same time EDG fault alarm is received.
CR-f Rod Worth Minimizer Initialization	1. Added "Ensure that all RWM alarm messages are cleared on the RWM screen prior to JPM starting" to the Tools and Equipment section on page 3 of 6. 2. Bolded cue in steps 2, 10, and 18 since it is required for JPM to progress. 3. Changed "Initialization" to "Initialize" in the cue and Standard for step #3. 4. Changed "FULLCORE" to all capitals in step #5.
CR-g ECW System Makeup to Emergency Cooling Tower Using ESW System	1. Added NOTE before steps 14 and 26 since these steps will require coordination with the Simulator Operator to open and close breakers locally. 2. Bolded cue in steps 3, 4, 5, 11, 13, 14, 21, 22, 24 and 26 since it is required for JPM to progress.
CR-h Manually Place SBGT on Equipment Cell Exhaust	1. Bolded cue in steps 2 and 20 since it is required for JPM to progress
IP-i Alternate RPV Injection Using the SBLC Test Tank	1. Added a fifth Task Condition /Prerequisite to state that a loss of power event is NOT in progress 2. Added the following Note at the beginning of the JPM: a. IF this is the first in-plant JPM then the license candidate is required to go to the EOP Tool Locker. For subsequent in-plant JPMs it is not necessary to have the candidate go to the Tool Locker for JPMs that require material from the locker. Describing where the locker is located, how to access key to unlock it, and what procedure packages/material would be obtained is sufficient for subsequent JPMs. 3. Revised step #3 to address that the required 50' section of hose is in a nearby locker 4. Reworded step #5 to match step #4. 5. Bolded cue in step #11 since it is required for JPM to progress. 6. Bolded cue in step #17 since it is required for JPM to progress.

JPM	Change(s)
IP-j RPV Venting During Containment Flooding	1. Added the following Note at the beginning of the JPM: a. IF this is the first in-plant JPM then the license candidate is required to go to the EOP Tool Locker. For subsequent in-plant JPMs it is not necessary to have the candidate go to the Tool Locker for JPMs that require material from the locker. Describing where the locker is located, how to access key to unlock it, and what procedure packages/material would be obtained is sufficient for subsequent JPMs 2. Updated standard in steps 5,6,10, and 11 to better address that a telephone must be used for communication while in the Cable Spreading Room. 3. Bolded cue in steps 5,6,10 and 11 since it is required for JPM to progress. 4. Added a bolded cue in steps 12 since it is required for JPM to progress.
IP-k Loss of RBCCW – Plant Actions for the Instrument Nitrogen System	1. Added the following Note right before step #4: "For the next 2 steps, after the examinee identifies the location of the control station for the AO-4230B on the TIP Room Roof, have them demonstrate required actions back on the control station for the AO-4230A since it is more accessible." 2. Bolded cue in step 10 since it is required for JPM to progress.
RO – COO #1 Manually Calculate Drywell Bulk Average Temperature with Failed Points	No changes needed.

JPM	Change(s)
SRO – COO#1 Resolution of Thermal Limits	1. Corrected spelling of "Monicore" in title on cover page. 2. Top of page 3 – added to print the 3D P1 edit on green paper (Unit 3). 3. Revised cue to identify Unit 3 and have Examinee "document all actions/notifications". 4. Added applicable GP-13 "Resolution of Thermal Limits" step numbers into JPM steps # 4,, 5, 6 , and 8. 5. Added TS LCO 3.2.2 wording in step #7 6. Added Examiners Note prior to step #7 stating that the other unit (Unit 2) Tech Spec LCO 3.2.2 applicability value is $\geq$ 23% RTP following EPU".
SRO – COO#2 Evaluate Overtime Work Request	1. Added OP-PB-101-111-1002, "Peach Bottom Operations Overtime Guidelines" to Tools and Equipment" and "Reference" sections. 2. Revised "Task Conditions/Prerequisites and Cue Sheet" was completely revised with the following: a. Added present date/time reference b. Changed RO 1 to RO#1 c. 2/6, 2/7, and 2/8 work hours shifted d. The following new Cue Sheet questions were inserted: i. Determine whether or not RO #1 is able to cover the required shift. ii. If applicable, document all work hour limits that would be exceeded if RO #1 works on Saturday 2/16. iii. Determine whether or not RO #1 has already violated any work hour limits. iv. If applicable, document all work hour limits that have already been exceeded.
SRO – EC Review a Temporary Procedure Change – Change of Intent	1. Revised wording in Task Standard to say "it has been identified that the proposed temporary change results in change of intent". 2. Task Condition/Prerequisite now states: A Temporary Change has been prepared for ST-R-003-495-2, "CRD Scram Insertion Timing of Selected Control Rods During Hydro". Steps 5.8, 6.17, and Data Sheet 3 have been modified." 3. Added new note at beginning of JPM: "Provide marked up procedure change AND a copy of procedure AD-PB-101-1003 to the Examinee." 4. Added that either decision choice in step #2 is acceptable. 5. The Temporary Change Control Form will be printed on white paper. 6. The word "Criteria" will be removed from the Temporary Change Control Form.
SRO – RC Perform Primary Containment Purge / Vent Isolation Valve Cumulative Log	1. Changed last sentence of Initiating Cue to "Document all errors on procedure copy, if applicable."

JPM	Change(s)
RO – COO #2 Perform an APRM Scram Margin Check	This JPM setup was modified to have the Examinee do a Scram margin check on APRM #1 (used to be APRM #4) as part of performing ST-O-001-200-2, "Turbine Stop Valve Closure and EOC-RPT Functional" in order to determine if there is enough scram margin to continue on with the test. APRM #1 was selected since the procedure will require a scram margin check on it first. 1. Added the following to Section B "Tools and Equipment" a. "A copy of ST-O-001-200-2, Rev. 29, "Turbine Stop Valve Closure and EOC-RPT Functional", with procedure steps marked up and completed up to and including step 6.1.1. The Examinee will continue the surveillance at step 6.1.2." 2. Cue Sheet now states: a. Unit 2 is at full power (approximately 100%). b. ST-O-001-200-2, "Turbine Stop Valve Closure and EOC-RPT Functional", is in progress. c. All APRM Channels are operable. d. INITIATING CUE: The Control Room Supervisor directs you to perform steps 6.1.2 and 6.1.3 of ST-O-001-200-2, "Turbine Stop Valve Closure and EOC-RPT Functional". Inform the Control Room Supervisor when the steps are completed and whether the surveillance can be continued. 3. Step #10 - Changed calculated Scram Margin value from 17.7% to 16.1%. 4. Added the following note after step #10 to ensure that only one scram margin check is performed: At this time the Evaluator should inform the Examinee that the remaining 3 APRM Scram Margin checks have been completed with the same results obtained. 5. Bolded cue in steps 1, 2, and 13 since it is required for JPM to progress.
RO – EC Determine Status of Instrument Nitrogen Compressor Discharge SV Using Station P&IDs	1. Deleted the Note from step # 8. 2. Deleted the word "loud" in the description of the SV humming noise from both the Task/Prerequisites and the Initiating Cue. 3. Deleted the drawing references from the Initiating Cue. 4. Bolded cue in step #8 since it is required for JPM to progress.
RO – EP ERO Response Augmentation Using the Everbridge Call Out System	1. Added "Proprietary – Not for Public Release" on the top of the cover page. 2. Added to Tools and Equipment Section: "Optional - a pager that will receive a call out from Scenario 11 to verify that the call out was successfully completed. Contact the Site EP Coordinator. 3. Changed Initiating Cue to read "Obtain a PEER CHECK from NRC Examiner....." 4. Note after step #6 changed as follows: a. "Evaluator" to "NRC Examiner" b. Removed "true (valid)" from peer check description c. Underlined "to minimize risk of initiating an actual ERO callout."

JPM	Change(s)
SRO – EP Make EAL Classification & State /Local Notifications for ALERT – Inability to Maintain Cold Shutdown	1. Added the following to the Tools and Equipment section: a. "Ensure there are multiple copies of EP binders available that contain all the procedures listed below in the References Section C." b. Copy of PMS Met Data screen that displays a wind direction of 75 degrees and a wind speed of 5 mph. 2. Initiating Cue changed to: a. As the Emergency Director: i. Make the EAL classification. Inform the Proctor when you have made a declaration. ii. Complete the State/Local Event Notification form. Inform the Proctor when you have completed the State/local Event Notification Form. 3. Changed step #7 Standard to ALERT Classification.

Scenario 1 Changes Based on NRC Comments

- Event 1 (Secure the Drywell Purge Line up)
  - Added detail on how to secure Drywell purge including:
    - Procedure number and title
    - Valve nomenclature
    - Step numbers
    - Expected alarms received during the procedure
- Event 2 (Failure of a Primary Containment Isolation valve)
  - Moved Event 6 to Event 2 and changed the valve from AO-2505, "Drywell Air Purge Inlet Valve" to AO-2506, "INBD 18" Vent Valve".
  - Event 2 initiated when the crew begins to secure SBGT.
- Event 3 (Control Rod Withdrawal)
  - Moved from event 2 to 3.
- Event 4 (Mispostioned Control Rod)
  - Moved from event 3 to 4.
  - Moved the mispositioned rod to rod 42-35.
  - Event 3 will be complete before Event 4 occurs. This allows the lead examiner to move from event 4 to event 5 without requiring the crew to withdraw more Control Rods.
  - Add the specific ON-122 steps into the scripting.
- Event 5 (Loss of Main Condenser Vacuum)
  - Moved from event 4 to 5.
  - Included all alarms that are received during the initial event not just the one the crew needs to reference.
  - Included the steps from SO 8A.6.A-2, "Placing the Standby SJAE in Service and Placing the in Service SJAE in Standby" incase the crew does not use OT-106.
- Event 6 (Spurious start of A and C Core Spray pumps and a leak at the discharge of the A Core Spray pump)
  - Moved from event 5 to 6.
  - Added cooling tower trouble alarms.
  - Added use of the keylock switch to isolate the Core Spray suction.

- Added monitoring of Torus level.
- Added steps to rack out Core spray pump breaker.

- Event 7 (Startup level control valve fails closed)
  - Added ARC 201 H-1 Feedwater Field Instrument Trouble
- Event 8 (Steam leak in the Drywell)
  - Added information about chiller and pump starts to maximize drywell cooling.
  - Included potential entry into T-117, "Level Power Control"
  - Added detail on how to place HPCI into short term shutdown.
- Event 9 (ATWS)
  - Bolded steps that are related to the Critical Task.
  - Added detail on how to initiate ARI.
- Event 10 (RHR pump in Drywell Spray Trips)
  - Bolded steps that are related to the Critical Task.
  - Added detail on how to secure RHR following the RHR pump trip.
  - Assed detail on how to recommence Containment Sprays using the other RHR pump in the same loop or using the other RHR loop.

Scenario 2 Changes Based on NRC Comments

- Added blocking tag for the E-332 breaker to enhance the Tech spec call. Included the I/O overrides to block the E-332 breaker.
- Event 1 (Master Trip Solenoid valves routine test)
  - No changes
- Event 2 (E4 Diesel Generator spurious start)
  - Moved the note to the Simulator Operator Directions section.
- Event 3 (RCIC 250 VDC bus failure)
  - Add Tech Spec 3.5.3 (RCIC) and Tec Spec 3.6.1 (PCIV) references.
  - Add a step indicating that the Crew may test annunciators.
- Event 4 (TBCCW pump trips with failure of standby pump to start)
  - No changes.
- Event 5 (Condenser Air In-leakage/fast power reduction w/ Recirc)
  - Included ARC 03 E-3 for "2 Unit Off Gas Recombiner Trouble" alarm.
- Event 6 (A RFP will not respond to changing Reactor Power)
  - No changes.
- Event 7 (Main Turbine high vibration / Reactor Scram)
  - Added an option step to scram instead of a GP-9 power reduction.
- Event 8 (ATWS)
  - Added information about when to restore instrument nitrogen.
  - Added information if the Recirc pumps trip on the 13 KV fast transfer or ARI initiation.
  - Bolded Critical task steps.
- Event 9 (Loss of EHC / Loss of RPV pressure control)
  - No changes.
- Changed the termination criteria to include having Torus cooling in-service and RPV pressure control with SRVs.

Scenario 4 Changes Based on NRC Comments

- Fixed the critical task for using the scram pushbuttons.
- Defeated ARI to support the critical task for using the scram pushbuttons.
- Event 1 (Placing the "B" EHC pump n-service)
  - Added computer point as an option to verify pressure for PI-4403.
  - Added alarm 205 K-3, "EHC Standby Pump not in Auto".
  - Added a step to provide discharge pressure of 1555 psig if asked as an Equipment Operator.
- Event 2 (Core Spray Snubber INOP)
  - No changes
- Event 3 (A RWCU Pump High Winding Temperature)
  - Added that the Crew may close MO-2-12-15, "RWCU Inboard Isol" but it is not required.
- Event 4 ("B" ESW Room Flooding)
  - Reformatted so the actions directed from the Room Flooding ARC are clear.
- Event 5 (Loss of RBCCW Cooling)
  - Added ARC 214 A-5 and 214 F-5.
  - Added step for Nitrogen compressor trouble if necessary.
  - Added a step to direct monitoring of Recirc pump temperatures.
- Event 6 (Failed Seal on the "B" Recirc Pump)
  - Added ARC reference for seal failures.
  - Added detail for how to maximize drywell cooling.
  - Changed guidance to trip the Recirc pump instead of secure the Recirc pump.
  - Removed the step to reduce the speed to 30% since the Recirc pump will be tripped.
- Event 7 (Suction valve fails to close)
  - Added this as a separate event
- Event 8 (Failure of the Auto Scram and Reactor Mode Switch)
  - Bolded Critical task step.

    - Added detail that while the mode switch is in Shutdown it did not cause the Scram.
- Event 9 (Steam leak worsens)
    - Added ON-120 entry condition.
    - Listed the entry conditions for T-102.
    - Bolded Critical tasks.
    - Added detail on how to trip HPCI.
    - Added detail on how to spray the Torus.
    - Added detail on how to spray the Drywell.
    - Added steps if the Crew decides to do a T-112 blowdown at 281^{0}F.
- Event 10 (Drywell to RBCCW Leak)
    - Bolded Critical tasks.