Facility: Peach Bottom Date of Examination: 02/25/2019

Examination Level: RO ☒ SRO ☐ Operating Test Number: 2019 NRC

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, S	G2.1.29(4.1) - Lineup Standby Gas Treatment System For Automatic Operation (PLOR 337C)
Conduct of Operations	N, R	G2.1.25 (3.9) Perform AO 10.12-2 "Alternate Shutdown Cooling" (PLOR 384C)
Equipment Control	D, R, P	G2.2.41 (3.5) - Determine Status of Instrument Nitrogen Compressor Discharge Solenoid Valve Using Station Piping and Instrumentation Drawings (PLOR-220C) (2015 NRC)
Radiation Control	N/A	Not Required
Emergency Plan	D, R	G2.4.43 (2.8) – Direct a Site Evacuation (PLOR-94C)

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: 02/25/2019

Examination Level: RO ☐ SRO ☒ Operating Test Number: 2019 NRC

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, R	G2.1.20 (4.6) - Review Daily Jet Pump Operability Surveillance (PLOR 282C)
Conduct of Operations	D, R	G2.1.32 (4.0) - Evaluation Of High CRD Temperature On Control Rod Scram Time (PLOR 347C)
Equipment Control	D, R	G2.2.40 (4.7) - Compensatory Actions for an Inoperable Fire Door (273C)
Radiation Control	D, R	G2.3.4 (3.7) - Review and Authorize Two Emergency Exposures (287C)
Emergency Plan	N, R	G2.4.41 (3.6) Classification of Emergencies and PARS

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: 02/25/2019
Exam Level: RO ☒ SRO-I ☐ SRO-U ☐	Operating Test Number: 2019 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. 202002 A4.07 (3.3/3.2) - Recirculation Flow Control System / Reset the Recirculation System Upper Flow Limit [PLOR-007C]	D, S	1
b. 206000 A2.09 (3.5/3.7) - High Pressure Coolant Injection / Raise HPCI Flow (Alternate Path - Suction Valves Fail to Swap on Low Condensate Storage Tank Level) (PLOR-333CA)	A, D, EN, S	2
c. 239001 A4.01(4.2/4.0) - Main Steam System / Open Main Steam Isolation Valves After a Group-1 Isolation (PLOR-083C)	D, L, S	3
d. 209001 A4.03 (3.7/3.6) – Manual Startup of CS for Injection (Alternate Path – CS Valve Trips on Thermal Overload) (PLOR-383CA)	A, N, L, S	4
e. 223002 A4.03 (3.6/3.5) - Primary Containment Isolation System / Perform a Group 1 PCIS Isolation Reset (GP-8A) (PLOR-024C)	D, L, S	5
f. 262001 A4.04 (3.6/3.7) - AC Distribution / Excite The Main Generator (PLOR-031C)	D, S	6
g. 212000 A4.01 (4.6/4.6) – Inputting RPS trip IAW GP-25 (Alternate Path – Initial Channel Fails to Input Trip) (PLOR-385CA)	A, N, EN, S	7
h. 400000 A2.01 (3.3/3.4) Diesel Generator Quick Start from the Control Room (Alternate Path – ESW Pump Trips After Auto Start) (PLOR-284CA)	A, D, S	8
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. 217000 A1.04 (3.6/3.6) – Reactor Core Isolation Cooling / Defeat RCIC Interlocks IAW T-251-2 (PLOR-156P)	D, E, R	4
j. 218000 K4.04 (3.5/3.6) – Bypass of SV-9130A IAW T-331-3 (PLOR-386P) (Unit 3)	D, E, R	3
k. 201001 A2.06 (2.9/2.9) – Loss of CRD Regulating Function (Outside Control Room Actions) (PLOR-073P)	D, E, R	1

@	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: 02/25/2019

Exam Level: RO ☐ SRO-I ☒ SRO-U ☐ Operating Test Number: 2019 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. 202002 A4.07 (3.3/3.2) - Recirculation Flow Control System / Reset the Recirculation System Upper Flow Limit [PLOR-007C]	D, S	1
b. 206000 A2.09 (3.5/3.7) - High Pressure Coolant Injection / Raise HPCI Flow (Alternate Path - Suction Valves Fail to Swap on Low Condensate Storage Tank Level) (PLOR-333CA)	A, D, EN, S	2
c. 239001 A4.01(4.2/4.0) - Main Steam System / Open Main Steam Isolation Valves After a Group-1 Isolation (PLOR-083C)	D, L, S	3
d. 209001 A4.03 (3.7/3.6) – Manual Startup of CS for Injection (Alternate Path – CS Valve Trips on Thermal Overload) (PLOR-383CA)	A, N, L, S	4
e. 223002 A4.03 (3.6/3.5) - Primary Containment Isolation System / Perform a Group 1 PCIS Isolation Reset (GP-8A) (PLOR-024C)	D, L, S	5
g. 212000 A4.01 (4.6/4.6) – Inputting RPS trip IAW GP-25 (Alternate Path – Initial Channel Fails to Input Trip) (PLOR-385CA)	A, N, EN, S	7
h. 400000 A2.01 (3.3/3.4) Diesel Generator Quick Start from the Control Room (Alternate Path – ESW Pump Trips After Auto Start) (PLOR-284CA)	A, D, S	8
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. 217000 A1.04 (3.6/3.6) – Reactor Core Isolation Cooling / Defeat RCIC Interlocks IAW T-251-2 (PLOR156P)	D, E, R	4
j. 218000 K4.04 (3.5/3.6) – Bypass of SV-9130A IAW T-331-3 (PLOR-386P) (Unit 3)	D, E, R	3
k. 201001 A2.06 (2.9/2.9) – Loss of CRD Regulating Function (Outside Control Room Actions) (PLOR-073P)	D, E, R	1

@	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: 02/25/2019

Exam Level: RO ☐ SRO-I ☐ SRO-U ☒ Operating Test Number: 2019 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.		
b.		
c.		
d. 209001 A4.03 (3.7/3.6) – Manual Startup of CS for Injection (Alternate Path – CS Valve Trips on Thermal Overload) (PLOR-383CA)	A, N, L, S	4
e.		
f.		
g. 212000 A4.01 (4.6/4.6) – Inputting RPS trip IAW GP-25 (Alternate Path – Initial Channel Fails to Input Trip) (PLOR-385CA)	A, N, EN, S	7
h. 400000 A2.01 (3.3/3.4) Diesel Generator Quick Start from the Control Room (Alternate Path – ESW Pump Trips After Auto Start) (PLOR-284CA)	A, D, S	8
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. 217000 A1.04 (3.6/3.6) – Reactor Core Isolation Cooling / Defeat RCIC Interlocks IAW T-251-2 (PLOR156P)	D, E, R	4
j. 218000 K4.04 (3.5/3.6) – Bypass of SV-9130A IAW T-331-3 (PLOR-386P) (Unit 3)	D, E, R	3
k.		

@	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 Scenario No.: 1 Op-Test No.: 2019 NRC

Examiners: _____ Operators: _____

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Scenario Outline:

The scenario begins at 85% power with direction to lower power to 80% to allow the PRO to perform RT-O-001-408-2, "Cycling of Combined Intermediate Valves" for CIV 1 only.

When the RT is complete, Alarm 211 J-3, "Standby Liquid or Pipe Hi-Lo Temp" will be received. The crew will receive a report that the SLC tank temperature is 125^{0}F and rising slowly. The CRS should review Tech Specs and determine that Tech Spec 3.1.7, Condition C applies requiring temperature to be restored in 8 hours. The Crew should determine that the heater control has failed and that the breaker for the heaters should be opened. The CRS should direct that electrical power be removed to the SLC tank heaters.

When the Tech Spec determination had been made, the "A" Recirc pump speed will oscillate. The URO should notice the change in Reactor power. The Crew may enter and execute OT-104, "Positive Reactivity Insertion" base on the power changes. The Crew should enter and execute OT-112, "Unexpected Unexplained Change in Core Flow". The URO should place a speed hold on the "A" Recirc pump. The CRS should review Tech Specs for the Recirc flow mismatch (3.4.1).

After the speed hold is placed on the "A" Recirc pump, alarm "Logic Bus Power Lost" (222 A-5) will alarm. The Crew should enter and execute ARC 222 A-5. The PRO should recognize the Torus suction valves opening and close MO-2-13-18, "Condensate Tank Suction" valve to prevent draining the CST to the Torus. The PRO should also recognize that the RCIC Steam Supply valve is also isolated. The CRS should review Tech Specs for RCIC instrumentation (3.3.5.2 and 3.5.3). With the spurious RCICI system operation and the isolated Steam Supply valve the CRS should determine that RCIC is INOP and that Tech Spec 3.5.3.A applies and RCIC must be restored in 14 days.

When MO-2-13-18 is closed, The "B" Service water pump will trip. The Crew should enter and execute ON-127, "Loss of Service Water". The URO should start the standby service water pump.

When the standby service water pump has been started, a trip of the 2R4 Transformer Breaker will occur. Power will be lost to the 2R4 bus. The PRO will be able to cross tie the 2R4 bus with the 1R4 bus to recover power to loads lost on the loss of power.

The loss of power will also cause a loss of power to the "C" Instrument Air compressor. This will require the crew to enter and execute ON-119, "Loss of Instrument Air". The PRO should direct an Equipment operator to reset the under voltage trips to the "C" air compressor so the "C" air compressor can be restarted.

A Leak on the HPCI steam line will occur. Temperatures in the HPCI room will continue to rise. This will require the Crew to enter and execute T-103, "Secondary Containment Control". HPCI will fail to isolate when the Crew attempts to close MO-2-23-15, "HPCI Steam Isolation" valve. The leak will gradually worsen, requiring a reactor scram and entry into T-101, "RPV Control". **(Critical Task: When a Primary System is discharging into Secondary Containment through an unisolable leak, scram the Reactor prior to performing an Emergency Blowdown).**

When depressurization using Bypass Valves is performed, Bypass valves will initially function normally but then fail closed, requiring use of the SRVs or alternate methods for depressurization.

Conditions will continue to deteriorate in the Reactor Building due to the HPCI steam leak. When the second Reactor Building area (Torus Room) exceeds its T-103 Action Level, the crew should perform a T-112 "Emergency Blowdown". **(Critical Task: Perform an Emergency Blowdown when the second Reactor Building area Temperature exceeds an Action level).**

The scenario will end when the RPV is depressurized and RPV level is being maintained with Condensate.

Initial Conditions: Unit 2 is a approximately 85% power with no equipment out of service.

Turnover: Lower power to approximately 80%, then perform RT-O-001-408-2, "Cycling of Combined Intermediate Valves" for the # 1 CIV only.

Critical Tasks: **1**. When a Primary System is discharging into Secondary Containment through an unisolable leak, scram the Reactor prior to performing an Emergency Blowdown. **2**. Perform an Emergency Blowdown when the second Reactor Building area Temperature exceeds an Action level.

Event No.	Malf. No.	Event Type*	Event Description
1	See Scenario Guide	R URO CRS	Lower Reactor Power to approximately 80%
2	See Scenario Guide	N PRO CRS	Perform RT-O-001-408-2, "Cycling of Combined Intermediate Valves".
3	See Scenario Guide	TS CRS	High Temperature alarm on Standby Liquid Control Tank. Declare Standby Liquid Control INOP
4	See Scenario Guide	C URO CRS	"A" Recirc pump speed oscillates, place speed hold on "A" Recirc pump
5	See Scenario Guide	C PRO TS CRS	RCIC Logic Bus Power Loss, Close RCIC CST suction
6	See Scenario Guide	C URO CRS	"B" Service water pump trips, enter ON-127 and start the standby Service water pump
7	See Scenario Guide	C PRO CRS	Trip of 2R4 Transformer BKR. Cross tie 480 vac load centers.
8	See Scenario Guide	M ALL	HPCI steam leak. Conditions will degrade requiring a Reactor Scram
9	See Scenario Guide	C PRO CRS	Isolation fails and conditions degrade requiring a blowdown
10	See Scenario Guide	C URO CRS	Bypass valves fail closed. Use SRVs for depressurization
11	See Scenario Guide	M ALL	Blowdown when two areas in the Reactor Building exceed the action level.
*	(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor		

Facility: Peach Bottom Scenario No.: 2 Op-Test No.: 2019 NRC

Examiners: _____ Operators: _____

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Scenario Summary:

The scenario begins with the reactor at 100% power. After taking the shift the crew is required to swap operating TBCCW pumps for inspection of a noisy bearing on the 'A' TBCCW pump.

When the "B" TBCCW pump is in service, an individual control rod drive scram accumulator will experience low nitrogen pressure and alarm in the main control room. The crew will initiate corrective action but the accumulator pressure will remain low requiring the crew to declare the control rod slow or inoperable per Technical Specifications.

Following the Tech Spec determination, the E-4 Diesel Generator will inadvertently start and one minute later 005 F-1 "E-4 Diesel Gen Differential and Ground" alarm will annunciate. The crew will take action in the alarm response to shutdown the E-4 diesel generator and place in Pull-to-Lock. The CRS will apply Technical Specifications for an inoperable Diesel Generator.

Following the Diesel Generator Tech Spec determination, the crew should then recognize and respond to lowering Main Condenser vacuum caused by a failure of the in service Steam Jet Air Ejector steam supply valve. The crew must enter OT-106 "Condenser Low Vacuum" and reduce reactor power in accordance with GP-9-2 "Fast Power Reduction". The PRO should place the alternate air supply in service to recover Main Condenser vacuum.

When Main Condenser vacuum has stabilized, the "'A' Clean-up Recirc Pump Motor Winding Temperature High" alarm will annunciate. The Crew should enter and execute ARC 215 A-1 and dispatch an Equipment Operator to investigate the high temperature condition. The Equipment Operator will report that temperature is 142^{0}F and rising fast. The Crew may elect to Swap RWCU pumps or remove the "A" RWCU pump from service. If they elect to swap RWCU pumps, conditions will continue to deteriorate until the "'A' Clean-up Recirc Pump Motor Winding Temperature High-High" alarm is received. The "A" RWCU pump will not trip as expected and the URO will be required to remove the pump from service.

When the RWCU system is removed from service, the "B" Recirc pump will trip followed by a trip of the "A" Recirc pump one minute later. The URO will identify the loss of forced circulation and scram the Reactor. When the Reactor Mode switch is taken to Shutdown the control rods will begin to insert but a Hydraulic ATWS will occur. The loss of forced circulation will cause Thermal Hydraulic Instabilities.

The Crew should enter and execute T-101, "RPV Control" and T-117, "Level/Power Control." **(Critical Task: Inhibit ADS initiation during an ATWS with Feedwater available within 10 minutes and 12 seconds)**

When SBLC is initiated the SBLC pump will trip, requiring the URO to place the alternate SBLC pump in service. (**Critical Task: Attempt to shut down the Reactor by performing one or more of the following: T-216, "Control Rod Insertion by Manual Scram of Individual Scram Test Switches", T-220, "Driving Control Rods During a Failure to Scram", Injecting Standby Liquid Control Before Torus Temperature exceeds 110 degrees Fahrenheit.)**

The Crew will need to lower RPV level to below -60 inches to minimize the effects of THI. **(Critical Task: Perform T-240, "Termination and Prevention of Injection into the RPV to minimize Thermal-hydraulic instabilities (THI) until RPV level is below -60 inches)**. When the Crew has stabilized RPV level below -60 inches, the "C" RFP will trip and require the PRO to stabilize RPV level with an alternate system (HPCI, RCIC or the "A" or "B" RFP).

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.

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.

Initial Conditions: IC-14, 100% power with no equipment out of service

Turnover: The "A" TBCCW pump is making an unusual noise requiring the PRO to swap TBCCW pumps.

Critical Tasks: **1.** Attempt to shut down the Reactor by performing one or more of the following: T-216, "Control Rod Insertion by Manual Scram of Individual Scram Test Switches", T-220, "Driving Control Rods During a Failure to Scram", Injecting Standby Liquid Control Before Torus Temperature exceeds 110 degrees Fahrenheit. (T-101-4) **2.** Perform T-240, "Termination and Prevention of Injection into the RPV to minimize Thermal-hydraulic instabilities (THI) until RPV level is below -60 inches. (T-117-1) **3.** Inhibit ADS initiation during an ATWS with Feedwater available within 10 minutes and 12 seconds. (T-117-7)

Event No.	Malf. No.	Event Type*	Event Description
1	See Scenario Guide	N PRO CRS	Swap operating TBCCW Pumps
2	See Scenario Guide	TS CRS	Individual control rod drive scram accumulator low pressure (Tech Spec)
3	See Scenario Guide	C PRO TS CRS	E4 Diesel Generator spurious start / Diesel Generator shutdown (Tech Spec)
4	See Scenario Guide	C PRO CRS	Failure of Steam Jet Air Ejector Steam Supply valve / re-open by placing additional valve air supply in service
5	See Scenario Guide	R URO CRS	Fast Reactor power reduction (w/ Recirc) for lowering Main Condenser vacuum
6	See Scenario Guide	C URO CRS	"A" RWCU pump motor winding high temperature, remove the "A" RWCU pump from service and isolate the system
7	See Scenario Guide	C URO CRS	"B" and "A" Recirc pump trip. Mode switch to Shutdown
8	See Scenario Guide	M ALL	ATWS (hydraulic), lower RPV level to minimize THI
9	See Scenario Guide	C URO CRS	Standby Liquid Control (SBLC) pump trips / start second SBLC pump
10	See Scenario Guide	C URO CRS	"C" RFP trips, control RPV level with HPCI or another RFP

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

Facility: Peach Bottom Scenario No.: 3 Op-Test No.: 2019 NRC

Examiners: _____ Operators: _____

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Scenario Outline:

Unit 2 is at approximately 5% power with the "D" HPSW pump blocked out of service for a motor inspection. SRV's "E" and "L" have leaking bellows and a TCCP is applied to clear the alarm. When the Crew has the shift the PRO will secure the Drywell Purge lineup. When the purge line up is secured the URO will begin to withdraw control rods with a goal of three bypass valves open.

When control rods have been withdrawn, the "A" Drywell Chiller will trip. The crew should recognize the trip and start the standby chiller.

When the standby chiller is running, the "Blowdown Relief Valve Bellows Leaking" alarm will be received. The Crew will determine that the "C" SRV has the leaking bellows. The CRS should review Tech Spec (3.4.3) and determine that the SRV is INOP and condition A applies.

When the Tech Spec determination has been made, the Feedwater Water Level controller will fail causing the setpoint to fail to 12 inches. The Crew should enter and execute OT-100, "Reactor Low Level". The URO should take manual control of the startup level controller (AO 8091) and recover RPV level to 23 inches.

When RPV level is stable, control rod 02-31 will drift into the core. The Crew should enter and execute ON-121, "Drifting Control Rod" to insert and disarm the control rod. The control rod will not settle at position 00 and will need to be scrammed to get the rod to settle at position 00. The CRS should reference Tech Specs 3.1.3 for the INOP rod.

When the Tech Spec determination has been completed, a second control rod will drift into the core requiring the URO to scram the Reactor. **(Critical Task: Shutdown the reactor when a second control rod drifts into the core)**

Following the Reactor scram, a leak will develop in the Torus. The leak will require the Crew to align river water to refill the Torus. When the crew attempts to place the "B" HPSW pump in service it will trip. This will require the crew to place the "A" and "C" HPSW in service from the "A" loop.

When the crew attempts to bypass and restore instrument nitrogen the key lock bypass switch will fail to operate correctly and the Crew will be required to place the backup nitrogen bottles in service to provide a supply of nitrogen to the SRVs.

Torus level will continue to drop until an RPV blowdown is required. (**Critical Task: Perform an Emergency Blowdown when Torus level cannot be maintained above 10.5 feet.)**

The scenario may be terminated when the RPV is depressurizing and HPSW is injecting into the Torus.

Initial Conditions: Unit 2 is operating at approximately 5% power with the "D" HPSW pump out of service for motor inspection. SRV's "E" and "L" have leaking bellows and a TCCP is applied to clear the alarm.

Turnover: When the Crew takes the shift the PRO will be required to secure the Drywell Purge lineup. The URO will begin withdrawing control rods until 3 bypass valves are open.

Critical Tasks: **1**. Shutdown the reactor when a second control rod drifts into the core. **2**. Perform an Emergency Blowdown when Torus level cannot be maintained above 10.5 feet.

Event No.	Malf. No.	Event Type*	Event Description
1	See Scenario Guide	N PRO CRS	Secure the Drywell Purge lineup
2	See Scenario Guide	R URO CRS	Continue the Reactor Startup by withdrawing control rods
3	See Scenario Guide	C PRO CRS	"A" Drywell Chiller trips, start a Drywell chiller
4	See Scenario Guide	TS CRS	""C" SRV Bellows Leaking
5	See Scenario Guide	C URO CRS	"Master Feedwater Controller Failure, recover level with the bypass in manual
6	See Scenario Guide	C URO C PRO TS CRS	Control Rod 02-31 Drifts In followed by a second drifting control rod, insert control rod.
7	See Scenario Guide	M ALL	Torus leak, Fill the Torus with river water
8	See Scenario Guide	C PRO CRS	Instrument Nitrogen fails to bypass, place the backup bottles in service
9	See Scenario Guide	C PRO CRS	"B" HPSW pump trip, place the "A" loop of HPSW pumps in service
10	See Scenario Guide	M ALL	RPV Blowdown based on low Torus level

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

Facility: Peach Bottom Scenario No.: 4 Op-Test No.: NRC 2019

Examiners: _____ Operators: _____

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Scenario Outline:

The scenario begins with Unit 2 at 100% with no equipment out of service. When the Crew has the shift the PRO will place the "B" loop of Torus cooling in service to support testing.

The Crew will have direction to lower Reactor power with control rods to 95% following the supplied ReMA. As the URO insert control rods, a control rod will initially be stuck. The URO will take actions per SO 62.1.A-2, "Withdrawing Inserting a Control Rod". The Control Rod will move when drive pressure is raised.

When the control rod is moving the "D" HPSW pump will experience a timed overcurrent condition. Timed overcurrent will not trip the "D" HPSW pump and the PRO will need to remove the "D" HPSW pump from service and secure the Torus Cooling lineup. The CRS should review Tech Spec section 3.7.1, 3.6.2.3, 3.6.2.4 and 3.6.2.5 for the INOP HPSW pump.

When the Torus cooling lineup is secured, an RHR pipe break will cause flooding in the "D" RHR pump room. The CRS should direct the PRO to isolate the suction lineup for the "D" RHR pump to isolate the leak in the RHR room. The CRS should review Tech Spec section 3.5.1 for the INOP RHR pump.

When the RHR leak is isolated, a trip of the "A" Condensate pump will occur, the automatic Recirc runback will not occur and the URO will need to perform a manual runback to stabilize RPV level.

When RPV level is stable, a loss of the #2 bus will occur removing power from remaining Condensate pumps. The Crew should recognize the loss of Feedwater and scram the reactor. The Reactor Operators should take their scram actions. The CRS should enter and execute T-101, "RPV Control".

HPCI and RCIC should be used to maintain RPV level. HPCI and RCIC will trip when started. This combined with the loss of Feedwater is a loss of all high pressure feed. The RCIC trip can be reset and RCIC can be restarted. When RCIC is running, a Recirc line break larger than the capacity of RCIC will occur causing RPV level to drop and for Containment pressure to rise. **(Critical Task: Inhibit ADS before an automatic depressurization occurs.) (T-101-9)**

When RPV level drops to -172 inches, the crew should perform an Emergency Blowdown to lower RPV pressure and allow low pressure ECCS pumps to inject into the RPV. **(Critical Task: Perform an Emergency Blowdown when RPV level reaches -172 inches.) (T-111-4)** When RPV pressure drops to 450 psig, MO-2-10-25A, "RHR Inboard Discharge" and MO-2-10-25B, RHR Inboard Discharge" valves will trip on magnetics and MO-2-14-12A and MO-2-14-12B "Core Spray Inboard Discharge" valves will not automatically open and the Crew will need to open the Core Spray injection valves using the control switches to recover RPV level **(Critical Task: Following an Emergency Blowdown, open a low pressure ECCS injection valve to restore RPV level above -172 inches before RPV pressure is less than 270 psig and RPV level is less than -205 inches) (T-111-6)**

The scenario can end when RPV level has recovered above -172 inches.

Initial Conditions: Unit 2 is operating at 100% power with no equipment out of service.

Turnover: Place the "D" RHR in Torus cooling for testing. Insert control rods in accordance with the REMa to support testing.

Critical Tasks: **1**. Inhibit ADS before an automatic depressurization occurs. (T-101-9) **2**. Perform an Emergency Blowdown when RPV level reaches -172 inches. (T-111-4) **3**. Following an Emergency Blowdown, open a low pressure ECCS injection valve to restore RPV level above -172 inches before RPV pressure is less than 270 psig and RPV level is less than -205 (T-111-6) inches.

Event No.	Malf. No.	Event Type*	Event Description
1	See scenario guide	N PRO CRS	Place Torus cooling in service
2	See scenario guide	R URO CRS	Insert control rods in accordance with the ReMA
3	See scenario guide	C URO CRS	Stuck Control Rod, control rod moves when drive pressure is raised.
4	See scenario guide	C PRO TS CRS	"D" HPSW pump Over Current, secure HPSW pump and the Torus Cooling lineup
5	See scenario guide	C PRO TS CRS	"D" RHR room flood, isolate the suction valves to stop the leak
6	See scenario guide	C URO CRS	"A" Condensate pump trip with Recirc Runback Failure, URO reduces Recirc flow
7	See scenario guide	M ALL	Loss of #2 Buss causing a loss of High Pressure Feed (Loss of feedwater, HPCI trip, RCIC trip)
8	See scenario guide	C URO CRS	RCIC trip, can be manually reset
9	See scenario guide	M ALL	Recirc leak greater than RCIC flow rate, requires an Emergency Blow down
10	See scenario guide	C PRO CRS	ECCS Injection Valves Fail to open, manually align Core Spray for injection

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

Facility Name: Peach Bottom Date of Exam: 2/25/2019

Tier	Group	RO K/A Category Points												SRO-Only Points						
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2		G*		Total		
1. Emergency & Abnormal Plant Evolutions	1	3	3	4	N/A			4	3	N/A		3	20	4		3		7		
	2	1	2	1				1	1			1	7	1		2		3		
	Tier Totals	4	5	5				5	4			4	27	5		5		10		
2. Plant Systems	1	3	2	2	2	2	2	2	3	2	3	3	26	2		3		5		
	2	1	1	1	2	1	1	1	1	1	1	1	12	0	1	2		3		
	Tier Totals	4	3	3	4	3	3	3	4	3	4	4	38	3		5		8		
3. Generic Knowledge and Abilities Categories		1		2		3		4		10				1	2	3	4	7		
		3		2		2		3						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). (One Tier 3 Radiation Control K/A is allowed if the K/A is replaced by a K/A from another Tier 3 Category).
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 the 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 K/As 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/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) 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 10 CFR 55.43.

G* Generic K/As

ES-401	BWR Examination Outline							Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					02		Ability to determine and/or interpret the following as they apply to Partial or Complete Loss of Forced Core Flow Circulation: Neutron monitoring	3.1	1
295003 Partial or Complete Loss of AC / 6			06				Knowledge of the reasons for the following responses as they apply to Partial or Complete Loss of AC: Containment isolation	3.7	1
295004 Partial or Total Loss of DC Pwr / 6		01					Knowledge of the interrelations between Partial or Total Loss of DC Pwr and the following: Battery charger	3.1	1
295005 Main Turbine Generator Trip / 3						04.01	Knowledge of EOP entry conditions and immediate action steps.	4.6	1
295006 SCRAM / 1	01						Knowledge of the operational implications of the following concepts as they apply to SCRAM: Decay heat generation and removal.	3.7	1
295016 Control Room Abandonment / 7					01		Ability to determine and/or interpret the following as they apply to Control Room Abandonment: Reactor power	4.1	1
295018 Partial or Total Loss of CCW / 8			01				Knowledge of the reasons for the following responses as they apply to Partial or Total Loss of CCW: Isolation of non-essential heat loads: Plant-Specific	2.9	1
295019 Partial or Total Loss of Inst. Air / 8				02			Ability to operate and/or monitor the following as they apply to Partial or Total Loss of Inst. Air: Instrument air system valves: Plant-Specific	3.3	1
295021 Loss of Shutdown Cooling / 4						01.19	Ability to use plant computers to evaluate system or component status.	3.9	1
295023 Refueling Acc / 8	03						Knowledge of the operational implications of the following concepts as they apply to Refueling Accidents: Inadvertent criticality	3.7	1
295024 High Drywell Pressure / 5				11			Ability to operate and/or monitor the following as they apply to High Drywell Pressure: Drywell spray: Mark-I&II	4.2	1
295025 High Reactor Pressure / 3		09					Knowledge of the interrelations between High Reactor Pressure and the following: Reactor power	3.9	1
295026 Suppression Pool High Water Temp. / 5			02				Knowledge of the reasons for the following responses as they apply to Suppression Pool High Water Temp.: Suppression pool cooling	3.9	1
295027 High Containment Temperature / 5									0
295028 High Drywell Temperature / 5	01						Knowledge of the operational implications of the following concepts as they apply to High Drywell Temperature: Reactor water level measurement	3.5	1
295030 Low Suppression Pool Wtr Lvl / 5				01			Ability to operate and/or monitor the following as they apply to Low Suppression Pool Wtr Lvl: ECCS systems (NPSH considerations): Plant-Specific	3.6	1
295031 Reactor Low Water Level / 2				08			Ability to operate and/or monitor the following as they apply to Reactor Low Water Level: Alternate injection systems: Plant-specific	3.8	1
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1			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: Plant-Specific	4.1	1
295038 High Off-site Release Rate / 9						04.18	Knowledge of the specific bases for EOPs.	3.3	1
600000 Plant Fire On Site / 8					03		Ability to determine and/or interpret the following as they apply to Plant Fire On Site: Fire alarm	2.8	1
700000 Generator Voltage and Electric Grid Disturbances / 6		01					Knowledge of the interrelations between Generator Voltage and Electric Grid Disturbances and the following: Motors	3.1	1
K/A Category Totals:	3	3	4	4	3	3	Group Point Total:		20

ES-401	BWR Examination Outline							Form ES-401-1
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)								
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3									0
295007 High Reactor Pressure / 3			04				Knowledge of the reasons for the following responses as they apply to High Reactor Pressure: Safety/relief valve operation: Plant-Specific	4.0	1
295008 High Reactor Water Level / 2									0
295009 Low Reactor Water Level / 2						01.07	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
295010 High Drywell Pressure / 5		04					Knowledge of the interrelations between High Drywell Pressure and the following: Nitrogen makeup system: Plant-Specific	2.6	1
295011 High Containment Temp / 5									0
295012 High Drywell Temperature / 5									0
295013 High Suppression Pool Temp. / 5					02		Ability to determine and/or interpret the following as they apply to High Suppression Pool Temp.: Localized heating/stratification	3.2	1
295014 Inadvertent Reactivity Addition / 1									0
295015 Incomplete SCRAM / 1		05					Knowledge of the interrelations between Incomplete SCRAM and the following: Rod worth minimizer: Plant-Specific	2.6	1
295017 High Off-site Release Rate / 9				01			Ability to operate and/or monitor the following as they apply to High Off-site Release Rate: Radwaste	2.7	1
295020 Inadvertent Cont. Isolation / 5 & 7									0
295022 Loss of CRD Pumps / 1									0
295029 High Suppression Pool Wtr Lvl / 5									0
295032 High Secondary Containment Area Temperature / 5									0
295033 High Secondary Containment Area Radiation Levels / 9	02						Knowledge of the operational implications of the following concepts as they apply to High Secondary Containment Area Radiation Levels: Personnel protection	3.9	1
295034 Secondary Containment Ventilation High Radiation / 9									0
295035 Secondary Containment High Differential Pressure / 5									0
295036 Secondary Containment High Sump/Area Water Level / 5									0
500000 High CTMT Hydrogen Conc. / 5									0
K/A Category Totals:	1	2	1	1	1	1	Group Point Total:		7

ES-401	BWR Examination Outline											Form ES-401-1	
	Plant Systems - Tier 2/Group 1 (RO)												
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	#
203000 RHR/LPCI: Injection Mode						09						Knowledge of the effect that a loss or malfunction of the following will have on the RHR/LPCI: Injection Mode: Nuclear boiler instrumentation	3.4	1
205000 Shutdown Cooling					03							Knowledge of the operational implications of the following concepts as they apply to Shutdown Cooling: Heat removal mechanisms	2.8	1
206000 HPCI									07	07		Ability to monitor automatic operations of the HPCI including: Lights and alarms: BWR-2, 3, 4; Ability to manually operate and/or monitor in the control room: Condensate storage tank level: BWR-2, 3, 4	3.9; 3.5	2
207000 Isolation (Emergency) Condenser														0
209001 LPCS		02										Knowledge of electrical power supplies to the following: Valve power	2.5	1
209002 HPCS														0
211000 SLC								04			02, 12	Ability to (a) predict the impacts of the following on the SLC; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Inadequate system flow; Knowledge of surveillance procedures	3.1; 3.7	2
212000 RPS			10									Knowledge of the effect that a loss or malfunction of the RPS will have on following: The ability of the core cooling systems to provide adequate core cooling during loss of coolant accidents	3.5	1
215003 IRM		01										Knowledge of electrical power supplies to the following: IRM channels/detectors	2.5	1
215004 Source Range Monitor														0
215005 APRM / LPRM	10											Knowledge of the physical connections and/or cause-effect relationships between APRM / LPRM and the following: Reactor manual control system: Plant-Specific	3.3	1
217000 RCIC										01		Ability to manually operate and/or monitor in the control room: RCIC turbine speed	3.7	1
218000 ADS	05											Knowledge of the physical connections and/or cause-effect relationships between ADS and the following: Remote shutdown system: Plant-Specific	3.9	1
223002 PCIS/Nuclear Steam Supply Shutoff	04			08								Knowledge of the physical connections and/or cause-effect relationships between PCIS/Nuclear Steam Supply Shutoff and the following: High pressure coolant injection: Plant-Specific; Knowledge of PCIS/Nuclear Steam Supply Shutoff design feature(s) and/or interlocks which provide for the following:	3.5; 3.3	2
239002 SRVs									04			Ability to monitor automatic operations of the SRVs including: Acoustical monitor noise: Plant-Specific	3.6	1
259002 Reactor Water Level Control								05			01, 28	Ability to (a) predict the impacts of the following on the Reactor Water Level Control; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of applicable plant air systems; Knowledge of the purpose and function of major	3.2; 4.1	2
261000 SGTS						05						Knowledge of the effect that a loss or malfunction of the following will have on the SGTS: Reactor protection system: Plant-Specific	3.1	1
262001 AC Electrical Distribution							03				01, 20	Ability to predict and/or monitor changes in parameters associated with operating the AC Electrical Distribution controls including: Bus voltage; Ability to interpret and execute procedure steps.	2.9; 4.6	2
262002 UPS (AC/DC)										01		Ability to manually operate and/or monitor in the control room: Transfer from alternative source to preferred source	2.8	1
263000 DC Electrical Distribution				01								Knowledge of DC Electrical Distribution design feature(s) and/or interlocks which provide for the following: Manual/ automatic transfers of control: Plant-Specific	3.1	1
264000 EDGs					05							Knowledge of the operational implications of the following concepts as they apply to EDGs: Paralleling A.C. power sources	3.4	1
300000 Instrument Air			01					01				Knowledge of the effect that a loss or malfunction of the Instrument Air will have on following: Containment air system; Ability to (a) predict the impacts of the following on the Instrument Air; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal	2.7; 2.9	2
400000 Component Cooling Water							02					Ability to predict and/or monitor changes in parameters associated with operating the Component Cooling Water controls including: CCW temperature	2.8	1
K/A Category Totals:	3	2	2	2	2	2	2	3	2	3	3	Group Point Total:		26

ES-401	BWR Examination Outline												Form ES-401-1
	Plant Systems - Tier 2/Group 2 (RO)												
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	#
201001 CRD Hydraulic	03											Knowledge of the physical connections and/or cause-effect relationships between CRD Hydraulic System and the following: Recirculation pumps (seal purge): Plant-Specific	3.1	1
201002 RMCS														0
201003 Control Rod and Drive Mechanism														0
201004 RSCS														0
201005 RCIS														0
201006 RWM														0
202001 Recirculation														0
202002 Recirculation Flow Control														0
204000 RWCU														0
214000 RPIS														0
215001 Traversing In-core Probe														0
215002 RBM						04						Knowledge of the effect that a loss or malfunction of the following will have on the RBM: APRM reference channel: BWR-3, 4, 5	2.8	1
216000 Nuclear Boiler Inst.							01					Ability to predict and/or monitor changes in parameters associated with operating the Nuclear Boiler Inst. controls including: Recorders and meters	3.4	1
219000 RHR/LPCI: Torus/Pool Cooling Mode														0
223001 Primary CTMT and Aux.														0
226001 RHR/LPCI: CTMT Spray Mode											04, 49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.6	1
230000 RHR/LPCI: Torus/Pool Spray Mode														0
233000 Fuel Pool Cooling/Cleanup										05		Ability to manually operate and/or monitor in the control room: Pool temperature	2.7	1
234000 Fuel Handling Equipment														0
239001 Main and Reheat Steam														0
239003 MSIV Leakage Control														0
241000 Reactor/Turbine Pressure Regulator									01			Ability to monitor automatic operations of the Reactor/Turbine Pressure Regulator including: Turbine speed control: Plant-Specific	2.8	1
245000 Main Turbine Gen. / Aux.														0
256000 Reactor Condensate		01										Knowledge of electrical power supplies to the following: System pumps	2.7	1
259001 Reactor Feedwater								02				Ability to (a) predict the impacts of the following on the Reactor Feedwater; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Feedwater heater	3.1	1
268000 Radwaste					01							Knowledge of the operational implications of the following concepts as they apply to Radwaste: Units of radiation, dose and dose rate	2.7	1
271000 Offgas														0
272000 Radiation Monitoring				03								Knowledge of Radiation Monitoring design feature(s) and/or interlocks which provide for the following: Fail safe tripping of process radiation monitoring logic during conditions of instrument failure	3.6	1
286000 Fire Protection			03									Knowledge of the effect that a loss or malfunction of the Fire Protection will have on following: Plant protection	3.6	1
288000 Plant Ventilation				01								Knowledge of Plant Ventilation design feature(s) and/or interlocks which provide for the following: Automatic initiation of standby gas treatment system	3.7	1
290001 Secondary CTMT														0
290003 Control Room HVAC														0
290002 Reactor Vessel Internals														0
K/A Category Totals:	1	1	1	2	1	1	1	1	1	1	1	Group Point Total:		12

ES-401	BWR Examination Outline							Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					04		Ability to determine and/or interpret the following as they apply to Partial or Complete Loss of Forced Core Flow Circulation: Individual jet pump flows: Not-BWR-1&2	3.1	1
295003 Partial or Complete Loss of AC / 6									0
295004 Partial or Total Loss of DC Pwr / 6									0
295005 Main Turbine Generator Trip / 3						04 45	Ability to prioritize and interpret the significance of each annunciator or alarm.	4.3	1
295006 SCRAM / 1									0
295016 Control Room Abandonment / 7									0
295018 Partial or Total Loss of CCW / 8									0
295019 Partial or Total Loss of Inst. Air / 8					01		Ability to determine and/or interpret the following as they apply to Partial or Total Loss of Inst. Air: Instrument air system pressure	3.6	1
295021 Loss of Shutdown Cooling / 4									0
295023 Refueling Acc / 8						04 08	Knowledge of how abnormal operating procedures are used in conjunction with EOPs.	4.5	1
295024 High Drywell Pressure / 5									0
295025 High Reactor Pressure / 3									0
295026 Suppression Pool High Water Temp. / 5									0
295027 High Containment Temperature / 5									0
295028 High Drywell Temperature / 5									0
295030 Low Suppression Pool Wtr Lvl / 5									0
295031 Reactor Low Water Level / 2					03		Ability to determine and/or interpret the following as they apply to Reactor Low Water Level: Reactor pressure	4.2	1
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1					06		Ability to determine and/or interpret the following as they apply to SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown: Reactor pressure	4.1	1
295038 High Off-site Release Rate / 9						01 31	Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.	4.3	1
600000 Plant Fire On Site / 8									0
700000 Generator Voltage and Electric Grid Disturbances / 6									0
K/A Category Totals:	0	0	0	0	4	3	Group Point Total:		7

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Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3									0
295007 High Reactor Pressure / 3									0
295008 High Reactor Water Level / 2						04 04	Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	4.7	1
295009 Low Reactor Water Level / 2									0
295010 High Drywell Pressure / 5									0
295011 High Containment Temp / 5									0
295012 High Drywell Temperature / 5						04 47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	1
295013 High Suppression Pool Temp. / 5									0
295014 Inadvertent Reactivity Addition / 1									0
295015 Incomplete SCRAM / 1									0
295017 High Off-site Release Rate / 9									0
295020 Inadvertent Cont. Isolation / 5 & 7									0
295022 Loss of CRD Pumps / 1									0
295029 High Suppression Pool Wtr Lvl / 5					0 3		Ability to determine and/or interpret the following as they apply to High Suppression Pool Wtr Lvl: Drywell/containment water level	3.5	1
295032 High Secondary Containment Area Temperature / 5									0
295033 High Secondary Containment Area Radiation Levels / 9									0
295034 Secondary Containment Ventilation High Radiation / 9									0
295035 Secondary Containment High Differential Pressure / 5									0
295036 Secondary Containment High Sump/Area Water Level / 5									0
500000 High CTMT Hydrogen Conc. / 5									0
K/A Category Totals:	0	0	0	0	1	2	Group Point Total:		3

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Plant Systems - Tier 2/Group 1 (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	#
203000 RHR/LPCI: Injection														0
205000 Shutdown Cooling Mode														0
206000 HPCI														0
207000 Isolation (Emergency) Condenser														0
209001 LPCS											02.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	4.6	1
209002 HPCS														0
211000 SLC														0
212000 RPS								1 9				Ability to (a) predict the impacts of the following on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Partial system activation (half SCRAM)	3.9	1
215003 IRM											02.44	Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.4	1
215004 Source Range Monitor														0
215005 APRM / LPRM														0
217000 RCIC								0 5				Ability to (a) predict the impacts of the following on the RCIC; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: D.C. power loss	3.3	1
218000 ADS														0
223002 PCIS/Nuclear Steam Supply Shutoff														0
239002 SRVs														0
259002 Reactor Water Level Control														0
261000 SGTS														0
262001 AC Electrical Distribution														0
262002 UPS (AC/DC)														0
263000 DC Electrical Distribution											02.22	Knowledge of limiting conditions for operations and safety limits.	4.7	1
264000 EDGs														0
300000 Instrument Air														0
400000 Component Cooling Water														0
K/A Category Totals:	0	0	0	0	0	0	0	2	0	0	3	Group Point Total:		5

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Plant Systems - Tier 2/Group 2 (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	#
201001 CRD Hydraulic														0
201002 RMCS														0
201003 Control Rod and Drive Mechanism														0
201004 RSCS														0
201005 RCIS														0
201006 RWM														0
202001 Recirculation														0
202002 Recirculation Flow Control														0
204000 RWCU											02.40	Ability to apply Technical Specifications for a system.	4.7	1
214000 RPIS														0
215001 Traversing In-core Probe														0
215002 RBM														0
216000 Nuclear Boiler Inst.														0
219000 RHR/LPCI: Torus/Pool Cooling Mode								1.4				Ability to (a) predict the impacts of the following on the RHR/LPCI: Torus/Pool Cooling Mode; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or	4.3	1
223001 Primary CTMT and Aux.														0
226001 RHR/LPCI: CTMT Spray Mode														0
230000 RHR/LPCI: Torus/Pool Spray Mode														0
233000 Fuel Pool Cooling/Cleanup														0
234000 Fuel Handling Equipment														0
239001 Main and Reheat Steam														0
239003 MSIV Leakage Control														0
241000 Reactor/Turbine Pressure Regulator														0
245000 Main Turbine Gen. / Aux.														0
256000 Reactor Condensate														0
259001 Reactor Feedwater														0
268000 Radwaste														0
271000 Offgas											01.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.	4.2	1
272000 Radiation Monitoring														0
286000 Fire Protection														0
288000 Plant Ventilation														0
290001 Secondary CTMT														0
290003 Control Room HVAC														0
290002 Reactor Vessel Internals														0
K/A Category Totals:	0	0	0	0	0	0	0	1	0	0	2	Group Point Total:		3

Facility Name:Peach Bottom Date of Exam:2/25/2019

Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1. 32	Ability to explain and apply system limits and precautions.	3.8	1	4.0	
	2.1. 08	Ability to coordinate personnel activities outside the control room.	3.4	1	4.1	
	2.1. 45	Ability to identify and interpret diverse indications to validate the response of another indicator.	4.3	1	4.3	
	2.1. 42	Knowledge of new and spent fuel movement procedures.	2.5		3.4	1
	2.1.					
	2.1.					
	Subtotal			3		1
2. Equipment Control	2.2. 01	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	4.5	1	4.4	
	2.2. 39	Knowledge of less than or equal to one hour Technical Specification action statements for systems.	3.9	1	4.5	
	2.2. 05	Knowledge of the process for making design or operating changes to the facility.	2.2		3.2	1
	2.2. 18	Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.	2.6		3.9	1
	2.2.					
	2.2.					
	Subtotal			2		2
3. Radiation Control	2.3. 14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.4	1	3.8	
	2.3. 05	Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	1	2.9	
	2.3. 15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9		3.1	1
	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		3.8	1
	2.3.					
	2.3.					
	Subtotal			2		2
4. Emergency Procedures / Plan	2.4. 29	Knowledge of the emergency plan.	3.1	1	4.4	
	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	1	4.1	
	2.4. 25	Knowledge of fire protection procedures.	3.3	1	3.7	
	2.4. 38	Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required.	2.4		4.4	1
	2.4. 44	Knowledge of emergency plan protective action recommendations.	2.4		4.4	1
	2.4.					
	Subtotal			3		2
Tier 3 Point Total				10		7