

Simulation Facility PBAPS Scenario No. #1 Op Test No. 2021 NRC Re-Exam

Examiners _____ Operator _____ CRS (SRO)

_____ URO (ATC)

_____ PRO (BOP)

Init. Cond. IC-14 95% Power

Turnover

- Unit 2 is at 95% power with no equipment out of service. HPCI has been secured from a test run and is aligned for autostart. B loop of RHR is in Torus Cooling. Control Rods 34-07 and 38-07 have been partially inserted for testing.

Critical Tasks

Critical Task 1: Isolate the steam leak prior to Secondary Containment Temperature in a second area reaching the MSL

Critical Task 2: Begin to lower RPV water level to <-60" within 5 minutes of a failure to scram condition.

Critical Task 3: When the ATWS is terminated, open 5 ADS valves prior to Torus Water Level reaching 7'.

Event	Malfunction	Event Type*	Event Description
1	See Scenario Guide	N PRO CRS	Secure Torus Cooling
2	See Scenario Guide	C PRO TS CRS	Fire in 'D' HPSW Pump
3	See Scenario Guide	R URO CRS	Withdrawing Control Rods
4	See Scenario Guide	C URO CRS	Stuck Control Rod
5	See Scenario Guide	C PRO TS CRS	HPCI Steam Leak
6	See Scenario Guide	C URO CRS	High Vibes on 'B' RFP
7	See Scenario Guide	M ALL	Torus Leak
8	See Scenario Guide	I ALL	Electric ATWS

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

Scenario Summary The scenario begins with the reactor at approximately 95% power with no equipment out of service. The 'B' loop of RHR is operating in Torus Cooling. Two control rods (38-07 and 34-07) have been partially inserted for testing and are ready to be withdrawn.

Following shift turnover, the crew will secure Torus Cooling on the 'B' loop of RHR. While securing the lineup, a fire will develop in the 'D' HPSW pump. The crew will secure the 'D' HPSW pump and dispatch the Fire Brigade. The CRS will declare the 'D' HPSW pump inoperable per T.S. 3.7.1.A.

Once the technical specification declaration has been made, the crew will withdraw control rods to their full out position. Control Rod 38-07 will be stuck. The crew will perform the actions of SO 62.1.A-2 to raise drive water pressure to unstick the control rod.

Once drive water pressure has been restored to normal, a steam leak will develop in the Secondary Containment from the HPCI steam piping. HPCI room temperatures will rise and require entry into T-103, Secondary Containment Control. The PRO will isolate the steam leak by closing the HPCI Steam Supply Valve. The CRS will declare HPCI inoperable per T.S. 3.5.1.C.

Once the HPCI steam leak has been isolated and the appropriate tech spec call has been made, the crew will receive alarms for high vibrations on the 'B' RFP. The crew will check vibration levels and determine the 'B' RFP is required to be secured. The crew will place the 'B' RFP in standby per SO 6D.2.A-2.

While the crew is securing the 'B' RFP, leak in the Torus will occur. The crew will enter T-102 and attempt to align makeup sources to restore Torus water level. With the D HPSW pump out of service due to the fire, the crew will cross-tie HPSW and inject into the Torus using the 'A' and 'C' HPSW pumps. Torus water level will continue to lower, requiring the crew to perform a GP-4 shutdown.

When the reactor is scrammed, an Electric ATWS will occur. The crew will enter T-117, ATWS RPV Control, and initiate SBLC and lower RPV water level. Torus level will continue to lower, requiring the crew to enter T-112, Emergency Depressurization, and lower RPV pressure using DEHC to 350 psig. Once RPV pressure is being lowered using EHC, the scram air header will depressurize, and the crew will open 5 SRVs to initiate an RPV Blowdown.

The scenario may be terminated once 5 ADS valves are open and RPV Water Level is being restored to the normal band.

Simulation Facility PBAPS Scenario No. #2 Op Test No. 2021 NRC Re-Exam

Examiners _____ Operator _____ CRS (SRO)

_____ URO (ATC)

_____ PRO (BOP)

Initial Conditions IC-9 4-5% Power

Turnover • Unit 2 is at 4-5% power during a reactor startup.

Critical Task 1: Manually initiate HPCI and/or RCIC prior to RPV water level reaching TAF.**Critical Task 2: Perform an RPV blowdown within 5 minutes of a complete loss of RPV Water Level Indication.****Critical Task 3: Maintain core cooling by flooding the RPV to the Main Steam Lines within 10 minutes of completing the Emergency Blowdown.**

Event	Malfunction	Event Type*		Event
1	See Scenario Guide	N	URO CRS	Perform SDV Functional Test
2	See Scenario Guide	R	URO CRS	Continue Reactor Startup
3	See Scenario Guide	I	URO CRS	RWM Rod Block
4	See Scenario Guide	I	URO CRS	'D' APRM Fails Upscale
5	See Scenario Guide	C	PRO CRS	'A' Drywell Chiller Trip
6	See Scenario Guide	I	TS PRO CRS	Earthquake/RCIC Spurious Start
7	See Scenario Guide	TS	CRS	'A' APRM Fails Upscale
8	See Scenario Guide	M	ALL	Loss of Condensate
9	See Scenario Guide	I	URO CRS	HPCI Fails to Auto Initiate
10	See Scenario Guide	C	ALL	Aftershock/Loss of Level Indication

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

Scenario Summary The scenario begins with the reactor at approximately 4-5% power during a reactor startup.

Following shift turnover, the crew will perform ST-O-003-450-2, Scram Discharge Vent and Drain Valve Functional Test. The URO will cycle the Scram Discharge Valves closed, then back open per the surveillance procedure. Once completed, the crew will continue the reactor startup by withdrawing control rods until 3 bypass valves are open.

While withdrawing Control Rods, a spurious Rod Worth Minimizer rod block will occur. The crew will perform the alarm response and re-initialize the RWM. The fault will clear once the system is initialized.

Once the RWM has been initialized, 'D' APRM will fail upscale. The crew will perform the alarm response and bypass the 'D' APRM.

Once the 'D' APRM is bypassed, a trip of the 'A' Drywell Chiller will occur. The crew will perform the alarm response and place the 'C' Drywell Chiller in service.

Once the 'C' Drywell Chiller is in service, an earthquake will occur. The crew will enter SE-5, Earthquake, and inspect the plant for signs of damage. A spurious start of the RCIC turbine will occur. The crew will enter OT-104, Positive Reactivity Addition, and respond to trip RCIC. The CRS will declare RCIC inoperable per T.S. 3.5.3.A.

Once the technical specification declaration has been completed, the 'A' APRM will fail upscale. The CRS will declare the 'A' APRM inoperable per T.S. 3.3.1.1.A.

Once the technical specification declaration has been completed, the running Condensate pumps will trip; requiring the crew to scram the reactor. The crew will enter T-101, RPV Control and control plant parameters. SGBT will fail to automatically initiate, requiring the crew to manually initiate SGBT. HPCI will fail to automatically initiate and RCIC was tripped earlier in the scenario, so the crew will manually initiate those systems to control RPV water level.

While the crew is controlling plant parameters, an aftershock will occur, causing a total loss of level indication. The crew will enter T-116, RPV Flooding and flood the RPV to the Main Steam Lines.

The scenario may be terminated when an RPV Blowdown is performed and the RPV is flooded to the Main Steam Lines.