

Facility: Quad Cities Unit 1 & 2 Scenario No.: 1 Time Start: _____

Examiners: _____ Operators: (SRO) _____
 _____ (ATC) _____
 _____ (BOP) _____

Initial Conditions: Reactor Power is at 90% and 100% rod line. Torus Cooling is running with 1A and 1B RHR pumps and 1A and 1B RHRSW pumps running to the 1A RHR Heat exchanger.

Turnover: Raise reactor power to 100% using recirculation flow. Secure RHR Torus Cooling.

Event No.	Malf. No.	Event Type*	Event Description
1		R (ATC)	Raise recirculation flow to achieve 100% power IAW QCOP 0202-03 and QCGP 3-1.
2		N (BOP)	Shut down RHR Torus Cooling.
3		I/C (ATC)	Fail LPRM 16-33-C DOWNSCALE.
4		I/C (BOP), TS (SRO)	Fail EHC Pressure regulator downscale (Pressure > 1005 psig). Take actions IAW QCOA 5650-01. TS 3.2.2.
5		I/C (BOP)	RWCU Area Hi Area Temperature (>165 degrees F) due to steam leak. Failure of automatic isolation function.
6		I/C (ATC) TS (SRO)	ATWS/ECCS/RFP/HPCI/RCIC/TURB transmitter 1-0263-23A slowly fails downscale. TS 3.3.2.2, 3.3.3.1, 3.3.4.1, 3.3.5.1
7		M (all)	Rising Containment pressure and temperature due to a LOCA. Initiate an Emergency Depressurization when torus pressure cannot be maintained or when drywell temperature cannot be restored.
8		I/C (all)	Drywell Spray failure with a subsequent failure of drywell coolers to restart.

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

Quad Cities Scenario No.: 1 Event No.: 2 Page 1 of 1

Event Description:
Shut down RHR Torus Cooling

Time	Position	Applicant's Actions or Behavior
	NOTE	Crew can perform Event 1 concurrently with Event 2.
	SRO	Provides SRO oversight for shut down of RHR Torus Cooling.
	BOP	Obtains a copy of procedure QCOP 1000-09.
	BOP	Throttles closed MO 1-1001-36A/B.
	BOP	Stops running RHR pump and fully close MO 1-1001-36A/B.
	BOP	Closes MO 1-1001-34A/B.
	BOP	Opens MO 1-1001-16A/B.
	BOP	Opens MO 1-1001-18A/B.
	CUE:	Inform the candidate that another operator will secure RHRSW.
	NOTE	Crew can proceed to Event 3.

Quad Cities			Scenario No.: 1	Event No.: 3	Page _1_ of _3_
Event Description:					
Fail LPRM 16-33-C downscale.					
Time	Position	Applicant's Actions or Behavior			
	ATC	Reports LPRM DOWNSCALE alarm to SRO.			
	ATC	References Annunciator Procedure.			
	ATC	Reports LPRM 16-33-C is DOWNSCALE.			
	ATC	Selects rod near LPRM location; reports all other "C" level detectors in area read normally.			
	ATC/ BOP	Demands OD-8 printout.			
	SRO	Refers to QCOP 0700-03.			
	SRO	Directs actions of QCOP 0700-03.			
	SRO	Fills out LPRM bypass card and log per QCOP 0700-03, Attachment B.			
	ATC/ BOP	Reports APRM 2 will have only ONE "C" level input when LPRM is bypassed.			
	ATC/ BOP	Reports APRM 2 will have more than minimum number of inputs.			

Event Description:

Fail LPRM 16-33-C downscale.

Time	Position	Applicant's Actions or Behavior
	ATC/ BOP	Reports no APRM or IRM channels are bypassed.
	SRO	Refers to QCOP 0700-04 to bypass APRM.
	ATC	Verifies min APRMs per TS and TRM.
	ATC	Bypass APRM 2 with joystick and verifies bypass light lit.
	SRO	Refers to QCOP 0300-10 to address OPRMs.
	ATC	Place status tag on APRM 2 joystick.
	ATC	Determines appropriate OPRM affected.
	ATC	Bypasses OPRM with joystick and verifies white light lit.
	ATC	Places a status tag on joystick.
	SRO	Refers to QCAP 0230-19 for APRM outage report.
	ATC	Bypass LPRM 16-33-C on APRM 2.
	ATC	Verifies count meter drops 5%.

Quad Cities Scenario No.: 1 Event No.: 4 Page _1_ of _1_

Event Description:

Failure of EHC Pressure Regulator downscale (Pressure > 1005 psig). Take actions IAW QCOA 5650-01.

Time	Position	Applicant's Actions or Behavior
	ATC/ BOP	Observes one of the following symptoms: <ul style="list-style-type: none"> ● Reactor pressure (3 psig higher) and power change; ● Erratic Turbine Control Valve swing; ● Erratic Main Generator swing; ● Backup EHC pressure regulator "B" in control.
	SRO	Directs activities subsequent to pressure regulator failure.
	BOP	Verifies that EHC pressure regulator "B" is now in control
	BOP	Refers to QCOA 5650-01 for subsequent actions.
	BOP	Determines that reactor pressure is > 1005 psig.
	BOP	Reduces pressure to < 1005 psig using "Pressure Set"
	SRO	Enters into TS LCO 3.2.2, Action "A"
	SRO	Directs QNE to implement the alternative thermal limit set for Turbine Control Valve slow closure within two hours of the pressure regulator failure.
	NOTE	Crew can proceed to Event 5.

Quad Cities	Scenario No.: 1	Event No.: 5	Page _1_ of _2_
Event Description:			
RWCU Area High Area Temperature (> 165 degrees F) due to steam leak. Failure of automatic isolation function.			
Time	Position	Applicant's Actions or Behavior	
	BOP	Reports RWCU Area Temperature High alarm to SRO.	
	BOP	References annunciator procedure, QCAN 901(2)-4 A-12.	
	BOP	Monitor temperature in RWCU Area.	
	NOTE	RWCU Area temperature is > 165 degrees F	
	SRO	Enters into QGA 300 for High Area Temperature.	
	SRO/ BOP	Determine that RWCU system failed to isolate when temperature in the RWCU Area exceeded 165 degrees F.	
	SRO	Direct BOP to manually isolate the RWCU system as per QCAN 901(2)-4 A-12.	
	BOP	Close MO 1(2)-1201-2, Pump Suction Isolation Valve.	
	BOP	Close MO 1(2)-1201-5, Pump Suction Isolation Valve.	
	BOP	Close MO 1(2)-1201-80, Return Isolation Valve	
	BOP	Verifies RWCU High Area Temperature has stabilized.	

Quad Cities			Scenario No.: 1	Event No.: 6	Page _1_ of _2_
Event Description:					
ATWS/ECCS/RFP/HPCI/RCIC/TURB transmitter 1-0263-23A slowly fails downscale.					
Time	Position	Applicant's Actions or Behavior			
	ATC	Recognizes LI 1-0263-100 is trending downscale.			
	ATC	Verifies RPV level is stable by cross checking to other RPV level instruments, FRV position and steam flow/feed flow mismatch.			
	ATC	Reports 901-3, G-15, Reactor Vessel Low Low Level is alarming and refers to QCAN.			
	ATC/ BOP	Verifies no ECCS system or RCIC has started.			
	ATC/ BOP	Determine if any instrument testing is being performed.			
	ATC	Inform SRO to perform QCOS 1600-06.			
	BOP	Refers to QCOA 0600-12, FWLC System Trouble, for DFWLC system alarm.			
	ATC/ BOP	Verifies RPV level is stable.			

Quad Cities			Scenario No.: 1	Event No.: 7	Page _1_ of _7_
Event Description:					
Rising Containment pressure and temperature due to a LOCA. Initiate an Emergency Depressurization when torus pressure cannot be maintained or when drywell temperature cannot be restored.					
Time	Position	Applicant's Actions or Behavior			
	ATC/BOP	Reports to SRO alarm 901-3 A-16, PRIM CNMT HI PRESS, actuated and refers to annunciator procedure.			
	ATC/BOP	Reports drywell pressure rising.			
	SRO	Refers to QCOA 0201-01.			
	ATC/BOP	Performs actions to: <ul style="list-style-type: none"> ● Investigate cause of increasing Drywell pressure; ● Attempt to isolate leak; ● If a reactor scram or Group II isolation occur, refer to appropriate QGA. 			
	ATC/BOP	Notifies Radiation Protection of elevated drywell pressure.			
	ATC/BOP	Monitor leak rate.			
	ATC/BOP	Starts another drywell cooler before drywell pressure reaches 2.5 psig.			
	SRO	Briefs crew on expected auto actions at 2.5 psig.			
	SRO	Enters QGA 100 and QGA 200 when drywell pressure reaches 2.5 psig.			

Quad Cities Scenario No.: 1 Event No.: 7 Page 2_ of 7_

Event Description:

Rising Containment pressure and temperature due to a LOCA. Initiate an Emergency Depressurization when torus pressure cannot be maintained or when drywell temperature cannot be restored.

Time	Position	Applicant's Actions or Behavior
	SRO	Re-enters QGA 100.
	ATC/BOP	Verifies isolations, ECCS starts, and DG starts (as applicable).
	ATC/BOP	Reports ECCS auto started.
	ATC/BOP	Reports Group II isolation occurred properly.
	ATC/BOP	Controls HPCI manually to control injection.
	ATC/BOP	Reports Diesels auto started.
	ATC/BOP	Controls level 0 - 48 inches.
	ATC/BOP	Confirms pressure is stabilized to below 1060 psig with ADS.
	ATC/BOP	Initiates RPV cooldown at ≤ 100 degrees F/hr with bypass valves, (if MSIVs are opened), or ADS valves as appropriate.
	SRO	Directs rapid RPV depressurization using Main Turbine bypass valves when entry into QGA 500-1 RPV Blowdown is anticipated.

Quad Cities			Scenario No.: 1	Event No.: 7	Page _3_ of _7_
Event Description:					
Rising Containment pressure and temperature due to a LOCA. Initiate an Emergency Depressurization when torus pressure cannot be maintained or when drywell temperature cannot be restored.					
Time	Position	Applicant's Actions or Behavior			
	ATC/BOP	Opens all Turbine Bypass valves using the bypass jack.			
	ATC/BOP	Reports load shed has occurred tripping RBCCW pumps and drywell coolers.			
	SRO	Directs actions of QCOP 5750-19 to restore RBCCW and DW coolers.			
	ATC/BOP	Verifies Bus 18 and 19 voltage >450 volts.			
	ATC/BOP	Takes the U1 DIV I DW CLR/RBCCW/FPC TRIP BYPASS switch to BYPASS position.			
	ATC/BOP	Takes the U1 DIV II DW CLR/RBCCW/FPC TRIP BYPASS switch to BYPASS position.			
	ATC/BOP	Starts 1A RBCCW pump.			
	ATC/BOP	Starts 1B RBCCW pump.			
	ATC/BOP	Starts drywell coolers one at a time.			
	ATC/BOP	Starts Drywell Booster Fan.			

Quad Cities Scenario No.: 1 Event No.: 7 & 8 Page _4_ of _7_

Event Description:

Rising Containment pressure and temperature due to a LOCA. Initiate an Emergency Depressurization when torus pressure cannot be maintained or when drywell temperature cannot be restored.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs actions of QGA 200.
	SRO	Directs torus pressure when torus pressure is >2.5 psig.
	ATC/BOP	Verifies torus level < 27 feet.
	ATC/BOP	Initiates torus sprays.
	SRO	Verifies drywell parameters are within DSIL curve when torus pressure exceeds 5 psig.
	SRO	Directs DW sprays.
	ATC/BOP	Verifies Torus level <17 feet.
	ATC/BOP	Verifies recirc pumps tripped.
	ATC/BOP	Trips all drywell coolers when directed by SRO.

Quad Cities Scenario No.: 1 Event No.: 7 & 8 Page _5_ of _7_

Event Description:

Event 7: Rising Containment pressure and temperature due to a LOCA. Initiate an Emergency Depressurization when torus pressure cannot be maintained or when drywell temperature cannot be restored.

Event 8: Drywell Spray failure with a subsequent failure of drywell coolers to restart.

Time	Position	Applicant's Actions or Behavior
	NOTE	Event 8 begins. (Drywell Spray failure with a subsequent failure of drywell coolers to restart.)
	NOTE	From this point forward, Events 7 and 8 will run concurrently.
	ATC/BOP	Attempts to initiate drywell sprays.
	ATC/BOP	Reports unable to initiate drywell sprays.
	SRO	Directs NLO investigate 26B valve breaker.
	ATC/BOP	Attempts to restart drywell coolers.
	ATC/BOP	Reports unable to restart drywell coolers.
	ATC/BOP	Starts torus cooling.
	ATC/BOP	Monitors torus level.
	ATC/BOP	Starts CAMs, monitors drywell and torus hydrogen and oxygen concentration.

Quad Cities			Scenario No.: 1	Event No.: 7 & 8	Page _6_ of _7_
Event Description:					
Event 7: Rising Containment pressure and temperature due to a LOCA. Initiate an Emergency Depressurization when torus pressure cannot be maintained or when drywell temperature cannot be restored.					
Event 8: Drywell Spray failure with a subsequent failure of drywell coolers to restart.					
Time	Position	Applicant's Actions or Behavior			
	SRO	Enters QGA 500-1 to blowdown the vessel when it is determined drywell temperature cannot be restored below 280 degrees F or torus cannot be maintained within PSP limits.			
	SRO	Directs actions of QGA 500-1.			
	SRO/ ATC/BOP	Report Drywell pressure above 2.5 psig.			
	ATC/BOP	Prevent injection from Core Spray and LPCI not needed for Core Cooling by diverting LPCI flow or placing pumps in PTL.			
	ATC/BOP	Reports torus level > 5 feet.			
	ATC/BOP	Opens all ADS valves, leaves switches in MAN.			
	ATC/BOP	Verifies all ADS valves open by acoustic monitor indication.			
	SRO	Stays in 500-1 for pressure control.			
	ATC/BOP	Monitors level instrument watching for indications of saturation			

Facility: Quad Cities Unit 1 & 2 Scenario No.: 2 Time Start: _____

Examiners: _____ Operators: (SRO) _____
 _____ (ATC) _____
 _____ (BOP) _____

Initial Conditions: Unit is shutting down. The shift is ready to begin step F.3 of QCGP 2-1. RHRSW "B" is OOS.

Turnover: QCGP 2-1 has been completed up to and including Step F.2.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Transfer auxiliary power from XFMR 11 to XFMR 12 IAW QCGP 2-1 step F.3.
2		R (ATC)	Continue plant shutdown by inserting rods IAW step F.4 of QCGP 2-1 and 4-1.
3	Imf NM08B 100	I/C (ATC) TS (SRO)	APRM channel #2 fails upscale with a failure to ½ scram. TS 3.3.1.1
4		I/C (BOP)	Feedwater Regulator Lockup.
5		I/C (ATC)	Rod misposition. Rod adjacent to rod being inserted drifts out one notch.
6		TS (SRO)	Large Lube Oil Leak from Unit 1 EDG. Unit 1 EDG to be declared INOPERABLE. TS 3.8.1, 3.7.1
7		I/C (BOP)	ADS Timer initiation. Invalid signal.
8		M (all)	Station Blackout occurs. Take actions to monitor plant parameters and restore electrical power IAW QCOA 6100-04, QCOA 6100-03 and/or QCOP 6500-08.

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

Quad Cities Scenario No.: **2** Event No.: **1** Page 1 of 1

Event Description:

Transfer auxiliary power from XRMR 11 to XFMR 12 IAW QCGP 2-1 step F.3.

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	Calls BPO LD for permission to transfer aux power from transformer 11 to transformer 12.
	BOP	Turns on Synchroscope for XFMR 12 to Bus 11 and verifies XFMRs 11 and 12 are in phase and voltages are equal.
	BOP	Closes breaker from XFMR 12 to Bus 11.
	BOP	Opens breaker from XFMR 11 to Bus 11.
	BOP	Turns off Synchroscope.
	BOP	Turns on Synchroscope for XFMR 12 to Bus 14 and verifies XFMRs 11 and 12 are in phase and voltages are equal.
	BOP	Close the breaker from XFMR 12 to Bus 14.
	BOP	Opens breaker from XFMR 11 to Bus 14.
	BOP	Turns off Synchroscope.
	NOTE	Crew can proceed to Event 2.

Quad Cities			Scenario No.: 2	Event No.: 3	Page _1_ of _2_
Event Description:					
APRM channel #2 fails upscale with a failure to ½ scram.					
Time	Position	Applicant's Actions or Behavior			
	ATC	Reports APRM #2 failed upscale.			
	ATC/BOP /SRO	Determines that a ½ scram was not inserted.			
	ATC	Manually inserts a ½ scram on the affected (A) channel.			
	ATC/BOP /SRO	Verifies the APRM #2 channel is failed by checking the back panel indications.			
	SRO	Directs APRM #2 bypassed IAW QCOP 0700-04, Step F.3.			
	SRO	Verifies minimum number of OPERABLE APRMs per Ts 3.3.1.1 and 3.10.7 and TRM Section 3.3.a.			
	ATC	Places APRM Bypass joystick to bypass APRM CH 2.			
	ATC/BOP	Verifies B-14, D-2, H-1, C-14 are reset on the 901-5 panel.			
	ATC/BOP	Places OPRM #2 to TEST.			
	ATC/BOP	Verifies OPRM INOP LED lit and 901-5, H-1 alarms.			
	ATC/BOP	Hangs an EST or AR tag on bypass joystick.			

Quad Cities			Scenario No.: 2	Event No.: 4	Page 1 of 1
Event Description:					
Feedwater Regulator Lockup with a failure to reset.					
Time	Position	Applicant's Actions or Behavior			
	NOTE	When Feedwater Lockup event is initiated, reactor water level will increase with neither FWRV controlling water level. Operator will have to take manual control.			
	BOP	Refers to QCOA 0600-01 to respond to feedwater regulator lockup event.			
	NOTE	This event may occur swiftly and require immediate response. Procedure use would then be a followup response.			
	BOP	Adjust deviation on 1 (2)-640-19A/B to match demand indication to A/B VLV POS INDICATOR.			
	BOP	Depresses 1(2) A/B VLV RESET pushbutton and hold for 5 seconds.			
	NOTE	FWRV response will not occur until manual control is taken.			
	BOP	Take manual control of the Feedwater Regulators.			
	BOP	Adjust Feedwater manually to maintain normal Band (+11 inches to +44 inches)			
	CUE	Crew can proceed to Event 5. Event 5 may be performed concurrently with Event 4.			

Quad Cities			Scenario No.: 2	Event No.: 8	Page __1__ of __4__
Event Description:					
Station Blackout occurs. Take actions to monitor plant parameters and restore electrical power IAW QCOA 6100-04, QCOA 6100-03 and/or QCOP 6500-08.					
Time	Position	Applicant's Actions or Behavior			
	ATC	Reports that reactor has scrammed. Reports that all rods are in.			
	SRO	Directs operators to take actions of QCOA 6100-3, LOSS OF OFF-SITE POWER.			
	BOP	Attempts to start the unit 1 and the 1/2 diesel generator.			
	BOP/ SRO	Dispatches an operator to start the Unit 1 and the 1/2 diesel generator locally.			
	BOP/ATC	Places the following breakers in PTL IAW QCOA 6100-03: <ul style="list-style-type: none"> - T11 to B11, B12, B13, B14 - T12 to B11, B12, B13, B14 - B13 to T15 - B14 to T16, T17 - B14 to B14-1 - B13 to B13-1 - B13-1 to T10 - B13 to T1A 			
	SRO/BOP/ ATC	Dispatches NLO to investigate loss of T-12.			
	SRO/BOP/ ATC	Dispatches an operator to locally monitor reactor water level at the 2201-5 and the 2201-6 racks or at the ATWS level indicators in the AUX electric room.			

Quad Cities			Scenario No.: 2	Event No.: 8	Page 2 of 4
Event Description:					
Station Blackout occurs. Take actions to monitor plant parameters and restore electrical power IAW QCOA 6100-04, QCOA 6100-03 and/or QCOP 6500-08.					
Time	Position	Applicant's Actions or Behavior			
	BOP/ATC	Operates HPCI/RCIC as necessary to maintain RPV level and pressure.			
	BOP/ATC	Verifies RB ventilation is isolated.			
	BOP/ATC	Verifies Gen H2 Main seal oil pump or emergency H2 seal oil pump is running.			
	SRO	Notifies U-2 SRO to restore power to both SBO 125 VDC battery chargers within 1 hour per QCOA 6100-17.			
	BOP/ATC	Places the following breakers/control switches in PTL and restores Bus 13-1 from Bus 23-1 IAW QCOP 6500-08, if 1/2 DG is not available. <ul style="list-style-type: none"> - B13-1 & B61 - 1/2 DG to B13-1 - B13 to B13-1 - "A" CS pump - "A" & "B" RHR pumps 			
	BOP/ATC	Places the following breakers/control switches in PTL and restores Bus 24-1 IAW QCOP 6500-08, if Unit One DG is not available: <ul style="list-style-type: none"> - B14 & B61 - U1 DG to B14-1 - B14 to B14-1 - "B" CS pump - "C" & "D" pumps 			

Event Description:

Station Blackout occurs. Take actions to monitor plant parameters and restore electrical power IAW QCOA 6100-04, QCOA 6100-03 and/or QCOP 6500-08.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs Operators to backfeed Bus 13 from 13-1 and Bus 14 from 14-1 IAW QCOA 6100-03 when AC power is available.
	BOP/ATC	Places the following breakers/control switches in PTL: <ul style="list-style-type: none"> - A, B, & C circulating water pumps - A, B, C, & D condensate pumps - A & B CRD pumps - A, B, C, & D RHR SW pumps - A, B, & 1/2 SW pumps
	BOP/ATC	Manually starts U-1 and 1/2 DG.
	BOP/ATC	Dispatches NLO to perform DG post-start checks.
	BOP/ATC	Closes the Bus 13 to 13-1 tie circuit breakers and verifies there is no load increase on the 1/2 DG.
	BOP/ATC	Closes the Bus 14 to 14-1 tie circuit breakers and verifies there is no load increase on the unit 1 DG.
	BOP/ATC	Energizes 480 VAC busses as necessary.
	BOP/ATC	Restarts RBCCW system as soon as possible.
	BOP/ATC	Starts drywell coolers and booster fans as load will permit.

Facility: Quad Cities Unit 1 & 2 Scenario No.: **3** Time Start: _____

Examiners: _____ Operators: (SRO) _____
 _____ (ATC) _____
 _____ (BOP) _____

Initial Conditions: RHRSW pump 1A inoperable. Reactor power is at 100% and the FWLC System is in 3 element control.

Turnover: 1A RHRSW pump has been inoperable for 29 days and 8 hours, but is expected to be back in service within the hour.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Transfer reactor level control from 3 element to 1 element and then back to 3-element.
2		R (ATC)	Reduce Power from 100% to 85% using recirculation flow.
3		TS (SRO)	1C RHRSW Inoperable (Water spilled/sprayed into motor casing.) TS 3.7.1 15 minutes later, 1A RHRSW pump is returned to service. TS 3.7.1
4		I/C (ATC)	Control Rod Drive Pump Failure.
5		I/C (BOP) TS (SRO)	Loss of Power to Bus 13-1 with a failure of the EDG to start. TS 3.8.1, 3.7.1
6		I/C (BOP) I/C (ATC) R (ATC)	Turbine Generator slowly loses stator water cooling. Both ATC and BOP need to take actions IAW QCOA 5300-01.
7		M (all) I/C (all)	MSL break with a failure to receive a Group 1 isolation on low steam pressure, close the MSIVs to limit plant cooldown to less than 100 degrees and recognize that a TS Safety Limit has been violated if pressure drops below 785 psig with power above 25%.

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

Quad Cities			Scenario No.: 3	Event No.: 1	Page ___ of ___
Event Description:					
Transfer reactor level control from 3 element to 1 element and then back to 3 element.					
Time	Position	Applicant's Actions or Behavior			
	BOP	Verifies that reactor water level is in the normal operating band with no unusual oscillations.			
	BOP	Verifies that no power changes are in progress with steam and feed flow stable.			
	BOP	Transfer reactor level control to 1-element.			
	BOP	Monitor reactor level and feedwater flow to ensure stable system operation.			
	CUE	Allow approximately 3 - 5 minutes for the system to stabilize. Instruct crew to transfer back to 3-element.			
	BOP	Verify that reactor water level is between +25 and +35 with no unusual oscillations.			
	BOP	Verify that there are no power changes in progress with steam and feed flow stable.			
	BOP	Transfer reactor level control to 3-element.			

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Event Description:

1C RHRSW Inoperable (Water spilled/sprayed into motor casing.) **TS 3.7.1 15**
 minutes later, 1A RHRSW pump is returned to service. **TS 3.7.1**

Time	Position	Applicant's Actions or Behavior
	CUE	Operator reports that workers have spilled a bucket of water onto the 1C RHRSW. The water spilled into and inside of the motor casing.
	SRO	Recognize that entry into LCO 3.7.1 is required and Action A.1 and B.1 taken.
	NOTE	At this point, event 4 can be run concurrently with this event. However, both event 3 and 4 should be complete before beginning event 5.
	CUE	Operator reports that work is complete on 1A RHRSW pump and that the pump is returned to service.
	SRO	Recognize that LCO 3.7.1, Action B can be exited.
	SRO	Recognize that the inoperability of 1C RHRSW pump only gives a 24 hour extension to the original A.1 completion time for the 1A RHRSW pump.
	NOTE	SRO should recognize that there is only 40 hours left before the plant needs to take the actions required under LCO 3.7.1, Action E.1 and E.2.
	CUE	Crew can proceed to event 4.

Quad Cities Scenario No.: 3 Event No.: 4 Page _1_ of _1_

Event Description:
Control Rod Drive Pump Failure (A Pump).

Time	Position	Applicant's Actions or Behavior
	BOP	Report that A CRD Pump has tripped.
	BOP	Verify MO 1(2)-301-2B, 1(2) B PMP DISCH VLV is closed.
	BOP	Start B CRD pump.
	BOP	Throttle MO 1(2)-301-2B is to maintain 1400-1500 psig discharge pressure.
	BOP	Close MO 1(2)-301-2A, 1(2) A CRD PMP DSCH VLV.
	BOP/SRO	Dispatch an operator to verify proper operation of the running pump.
	BOP	Close 1(2)-301-254A, 1(2)A CRD PUMP MIN FLOW ISOLATION VLV.
	BOP	Open 1(2)-301-254B, 1(2)B CRD PUMP MIN FLOW ISOLATION VLV.
	CUE	Crew can proceed to event 5.

Quad Cities Scenario No.: 3 Event No.: 6 Page _1_ of _2_

Event Description:

Turbine Generator slowly loses stator water cooling. Both ATC and BOP need to take actions IAW QCOA 5300-01.

Time	Position	Applicant's Actions or Behavior
	BOP	Reports GEN STATOR COOLING PANEL TROUBLE alarm and refers to the annunciator procedure.
	BOP/SRO	Immediately dispatches an operator to the stator cooling water panel and the pumps.
	BOP	Checks Load Set for runback.
	SRO	Directs the actions of QCOA 5300-01.
	BOP	Reports unable to start standby stator cooling water pump.
	BOP/ATC	Initiates emergency power reduction to avoid a neutron flux scram per QCGP 3-1.
	BOP	Reduces VARS on generator to zero.
	SRO	Sets scram criteria: <ul style="list-style-type: none"> - 9th bypass valve open; or - reactor pressure increasing; or - oscillations on neutron monitoring
	BOP/SRO	Dispatches an operator to the stator cooling panel to check stator cooling water conductivity.

Quad Cities Scenario No.: 3 Event No.: 7 Page <u>1</u> of <u>3</u>		
Event Description: MSL break with a failure to receive a Group 1 isolation on low steam pressure, close the MSIVs to limit plant cooldown to less than 100 degrees and recognize that a TS Safety Limit has been violated if pressure drops below 785 psig with power above 25%.		
Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledges 903-3 D1 Turbine Bldg Hi Rad alarm, informs SRO, and checks annunciator procedure.
	BOP	Monitors ARM trip units (901-11) and recorders (901-2) to validate alarm.
	BOP/SRO	Evacuate the affected areas.
	BOP/SRO	Notifies RP and operator of existing conditions and requests access control of affected areas and determination of source of radiation.
	BOP/ATC	Refers to QCOA 1800-01.
	BOP/ATC	Acknowledges 912-5 C-2 Turbine Bldg Low D/P alarm, informs SRO, and refers to annunciator procedure.
	BOP/ATC	Checks for proper fan operation.
	BOP/ATC	Dispatches personnel to check for open doors in building.
	BOP/ATC	Notify RP supervision.

Event Description:

MSL break with a failure to receive a Group 1 isolation on low steam pressure, close the MSIVs to limit plant cooldown to less than 100 degrees and recognize that a TS Safety Limit has been violated if pressure drops below 785 psig with power above 25%.

Time	Position	Applicant's Actions or Behavior
	BOP/ATC	Start additional fans as necessary.
	BOP/ATC	Reports TURBINE BLDG FLOOR DRAIN SUMP HIGH LEVEL alarm and refers to the annunciator procedure.
	BOP/ATC	Verifies sump pumps are running.
	BOP/ATC	Dispatches operator to check for leaking lines to sump.
	BOP/ATC	Reports turbine steam flow dropping and generator load dropping.
	SRO	Directs actions of QCOA 0201-05 "Slow Leak Outside Containment"
	BOP/ATC	Using annunciators 901-3 D-1, 912-5 C-2, and 901-4 D-20, determines leak is likely in turbine building.
	SRO	Orders reactor scrammed and MSIVs shut to isolate leak.
	ATC	Scrams reactor.
	BOP	Shuts MSIVs.

Event Description:

MSL break with a failure to receive a Group 1 isolation on low steam pressure, close the MSIVs to limit plant cooldown to less than 100 degrees and recognize that a TS Safety Limit has been violated if pressure drops below 785 psig with power above 25%.

Time	Position	Applicant's Actions or Behavior
	BOP/ATC	Trips HWC???
	BOP/ATC	Monitors reactor building exhaust activity release rates on 1/2-1740-203 at 912-1 panel.
	SRO	Notified Shift Manager for possible E-Plan.
	SRO	Recognizes a safety limit has been violated if power is >25% with reactor pressure <785 psig.
	SRO	Reviews E-Plan and declares no EAL classification.
	SRO	If TS Safety Limit was exceeded, determines 1 hour reportable to NRC per Reportability Manual.
	SRO	Determines 4 hour ENS to NRC for RPS actuation, 8 hours ENS to NRC for manual GPI isolation.
	CUE	End of Event 7. End of Scenario 3.

Facility: Quad Cities Unit 1 & 2 Scenario No.: **4** Time Start: _____

Examiners: _____ Operators: (SRO) _____
 _____ (ATC) _____
 _____ (BOP) _____

Initial Conditions: 1B Recirculation Pump is tripped, but it is ready to be started. "B" LPCI subsystem is Inoperable due to replacement of the "D" LPCI pump suction valve. The last performance of SR 3.8.1.3 for the Unit 1 EDG was 38 days ago.

Turnover: Unit Supervisor has directed the restart of 1B Recirculation Pump. Additionally, since the Unit EDG is in the last day of its required SR 3.8.1.3 periodicity, the BOP operator is to perform the Unit 1 EDG load test.

Event No.	Malf. No.	Event Type*	Event Description
1		R (ATC)	Start 1B recirculation pump and monitor parameters IAW QCOP 0202-02. Raise flow for power ascension to 100% power.
2		N (BOP) TS (SRO)	Perform Unit 1 EDG monthly load test. TS 3.8.1, 3.5.1
3		I/C (ATC) TS (SRO)	Rod drifts out continuously. TS 3.1.3
4		I/C (BOP)	Trip of 1B Service Water Pump. Start 1A Service Water Pump.
5		I/C (ATC)	OPRM Channel 4 Failure
6		M (all) I/C (all)	Loss of condenser vacuum leads to ATWS with ED required. Terminate and prevent RPV injection except for boron, CRD, and RCIC. The following failures occur: 1) Failure of Main Turbine Bypass Valves; 2) Failure of RHR Pumps; 3) Failure of Torus vacuum breakers to close.

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

Quad Cities			Scenario No.: 4	Event No.: 1	Page _1_ of _2_
Event Description:					
Start 1B recirculation pump and monitor parameters IAW QCOP 0202-02. Raise flow for power ascension.					
Time	Position	Applicant's Actions or Behavior			
	SRO	Directs the restart of the 1B recirculation pump per QCOP 0202-02.			
	ATC	Verifies on the speed controller it is in Manual and start permissive is met as indicated by speed demand set at 29% for 2A pump and 19.5% for 2B pump (as indicated on the control algorithm display on the OWS).			
	ATC	Performs steps F.7 and F.9 of QCOP 0202-02.			
	SRO	Verifies acceptance criteria in steps F.7.e and F.9.d.			
	ATC	Starts the MG set by closing the drive motor breaker and verifies the speed controller indication increases to a peak of 80 percent speed, then decreases to minimum speed.			
	ATC	Verifies the generator field breaker closes as indicated by the red GEN FIELD BKR A/B indicating light.			
	ATC	Records the time the recirculation pump starts.			
	ATC	Opens the MO 1-202-5B Pump Discharge Valve until flow is seen or dual valve position.			
	ATC	If dual valve position indication or flow response is not observed in 2 minutes, the ATC trips the pump.			

Quad Cities			Scenario No.: 4	Event No.: 1	Page 2 of 2
Event Description:					
Start 1B recirculation pump and monitor parameters IAW QCOP 0202-02. Raise flow for power ascension.					
Time	Position	Applicant's Actions or Behavior			
	ATC	Jogs the discharge valve open for ½ second intervals until pump flow reaches 8000 gpm. After each jog, observes APRM and flow response.			
	ATC	Jogs the discharge valve open for 1 second intervals from 8000 gpm to 12000 gpm. After each jog, observes APRM and flow response.			
	ATC	Jogs the discharge valve open for 3 second intervals from 12000 gpm to 16000 gpm or until no further flow response is seen. After each jog, observes APRM and flow response.			
	ATC	Fully opens MO 1-202-5B ensuring control switch is left in the STOP position.			
	ATC/BOP	Verifies instrumentation readings per QCOP 0202-02, step F.13.			
	ATC	Performs step F.14 of QCOP 0202-02.			
	ATC	Performs jet pump operability per QCOS 0202-07 and QCOS 0202-05 or QCOS 0202-06.			
	ATC	Determines Total Core Flow and FCL.			
	CUE	Crew can proceed to event 2.			

Event Description:

Perform Unit 1 EDG monthly load test. TS 3.8.1, 3.5.1

Time	Position	Applicant's Actions or Behavior
		<i>Need a copy of QCOS 6600-41.</i>
	CUE	Operators in the U-1 Diesel Room have completed steps H.1.a through H.1.k of QCOS 6600-41, Attachment A. Steps H.3.c and H.3.d have also been completed.
	CUE	SRO will evaluate short duration time clock prior to continuing with evolution.
	SRO	Recognize that entry into TS LCO 3.8.1, Condition B, is required.
	SRO	Recognize that 1A RHR pump is also inoperable due to TS cascading Action statement 3.8.1, Action B.
	SRO	Recognize that entry into TS LCO 3.8.1, Condition D is required.
	BOP	Checks U1 DIESEL GEN VOLTS SELECT not in OFF.
	BOP	Notifies plant personnel of impending diesel start.
	BOP	Starts diesel generator by placing Diesel Gen Control Switch to START on 901-8 panel.
	BOP	Records diesel start time on QCOS 6600-01.

Event Description:

Perform Unit 1 EDG monthly load test.

Time	Position	Applicant's Actions or Behavior
	BOP	Directs operator to verify post start data for U-1 D/B per Attachment A.
	CUE	Wait 2 minutes and report, if asked, the following: The status is: 1) Upper and lower air start motors are retracted and secured; 2) DG Vent Fan is running; 3) Engine Speed 450 rpm; 4) DG Cooling Water Pump indicates running at panel 2251-37. (Otherwise report H.3.i, Attachment A is complete)
	BOP	Directs Operator to record whether or not water was present in the airbox.
	CUE	The airbox drain is throttled, no water drained out.
	BOP	Direct Operator to open and lock 1-4699-122 or 121 (as applicable).
	CUE	Report that 1-4699-122 or 121 is open and locked.
	BOP	5 minutes after start, directs Operator to increase DG speed to 900 rpm.
	BOP	Notifies SRO that Technical Specification time clock can be exited.

Event Description:

Perform Unit 1 EDG monthly load test.

Time	Position	Applicant's Actions or Behavior
	NOTE	Simulator Operator will be cued to raise DG speed to 900 rpm.
	BOP	Directs Operator to verify Vent Fan running and record field current.
	CUE	Inform Control Room that the DG Vent Fan is running and field current has been recorded.
	BOP	Records frequency and Voltage at 901-8 panel.
	BOP	Directs the Operator in the DG room to monitor diesel running parameters using Attachment B and to record operating parameters 30 minutes after diesel start and each 60 minutes thereafter.
	BOP	Directs the Local Operator to set Speed Droop to "50."
	NOTE	Request the simulator operator to set the speed droop to
	CUE	Speed droop is set at "50."
	BOP	Adjusts DG GOVERNOR switch to obtain 58.8 to 61.2 Hz.
	BOP	Adjusts DG VOLT REGULATOR (VARS) switch to obtain 3740 to 4580 volts.

Event Description:

Perform Unit 1 EDG monthly load test.

Time	Position	Applicant's Actions or Behavior
	BOP	Directs local Operator to record DG speed on Attachment A.
	CUE	Report that diesel speed is 900 rpm and recorded on Attachment A.
	BOP	Allows the diesel to run 2 to 4 minutes to warm up before loading.
	BOP	Informs the local Operator to remain in the DG room for contingency actions.
	CUE	Reply, "Understand remain in DG room for contingency actions."
	BOP	Informs SRO to enter short time clock when DG is synchronized to Bus 14-1.
	BOP	Turns on synchroscope for U-1 DG output breaker on panel
	BOP	Adjusts diesel governer and volt reg on 901-8 to achieve: (1) Synchroscope moving slowly in the fast direction; (2) INCOMING VOLTS slightly higher than RUNNING VOLTS.

Quad Cities			Scenario No.: 4	Event No.: 6	Page _1_ of _9_
Event Description:					
ATWS with ED required. Terminate and prevent RPV injection except for boron, CRD, and RCIC. The following failures occur:					
1) Failure of Main Turbine Bypass Valves;					
2) Failure of RHR Pumps;					
3) Failure of Torus vacuum breakers to close.					
Time	Position	Applicant's Actions or Behavior			
	BOP	Reports that a turbine trip has occurred.			
	ATC	Reports 6 rods did NOT insert. RWL < 0 inches and RPV and RPV pressure > 1060 psig.			
	BOP	Reports that Main Turbine Bypass valves failed open.			
	SRO	Directs actions of QGA 101.			
	BOP	Inhibits ADS.			
	BOP	Places Core Spray Pumps in PTL.			
	BOP/ATC /SRO	Verifies isolations/actuators for RPV level < 0 inches.			
	ATC	Places Mode Switch in Shutdown.			
	ATC	Initiates ARI.			
	ATC/BOP	Runback recirc pumps to minimum.			

Quad Cities			Scenario No.: 4	Event No.: 6	Page 2 of 9
Event Description:					
ATWS with ED required. Terminate and prevent RPV injection except for boron, CRD, and RCIC. The following failures occur:					
1) Failure of Main Turbine Bypass Valves;					
2) Failure of RHR Pumps;					
3) Failure of Torus vacuum breakers to close.					
Time	Position	Applicant's Actions or Behavior			
	ATC	Determine reactor power < IRM range 7.			
	SRO	Exits power leg of QGA 101 and directs entry into QCGP 2-3			
	SRO	Directs cooldown with ADS valves at < 100 degrees/hr.			
	SRO	Directs Low RPV water level isolations bypassed per QCOP 0250-02.			
	BOP/ATC	Requests jumpers installed per QCOP 0250-02.			
	SRO	Determines reactor power < 3% and directs RPV level band between 0 and 48 inches.			
	BOP/ATC	Control RPV level with preferred ATWS systems.			
	BOP/ATC	Checks acoustic monitor and reports "D" and "E" relief valves are open.			
	BOP/ATC	Reports 901-3 A-16, PRIM CNMT HI PRESS, alarm to SRO, refers to annunciator procedure.			

Quad Cities			Scenario No.: 4	Event No.: 6	Page _3_ of _9_
Event Description:					
ATWS with ED required. Terminate and prevent RPV injection except for boron, CRD, and RCIC. The following failures occur:					
1) Failure of Main Turbine Bypass Valves;					
2) Failure of RHR Pumps;					
3) Failure of Torus vacuum breakers to close.					
Time	Position	Applicant's Actions or Behavior			
	BOP/ATC	Monitor and report Drywell pressure.			
	SRO	Refers to QCOA 0203-01.			
	BOP/ATC	Reports Drywell/Torus DP system is operating properly.			
	SRO	Directs actions of QCOA 0203-01.			
	BOP/ATC	Attempts to close the affected valves by placing the key switch in OFF.			
	BOP/ATC	Attempts to close the affected valves by placing the key switch between MANUAL and AUTO.			
	BOP/ATC	Monitors Torus pressure and temperature and reports both rising rapidly.			
	BOP/ATC	Starts Torus cooling per QCOP 1000-30.			
	BOP/ATC	Monitors Torus temperature per QCOS 1600-31.			
	SRO	Directs actions of QCOA 0201-01.			

Quad Cities			Scenario No.: 4	Event No.: 6	Page _4_ of _9_
Event Description:					
ATWS with ED required. Terminate and prevent RPV injection except for boron, CRD, and RCIC. The following failures occur:					
1) Failure of Main Turbine Bypass Valves;					
2) Failure of RHR Pumps;					
3) Failure of Torus vacuum breakers to close.					
Time	Position	Applicant's Actions or Behavior			
	BOP/ATC	Investigate cause of Increasing Drywell Pressure. <i>(Is this a direct result of event or has another failure occurred.)</i>			
	BOP/ATC	Notify Radiation Protection of elevated containment pressure.			
	BOP/ATC	Announce evacuation of Reactor Building.			
	BOP/ATC	Monitor leak rate.			
	BOP/ATC	Start another Drywell Cooler before Drywell pressure reaches 2.43 psig.			
	BOP/ATC	Restart RBCCW and Drywell Coolers per QCOP 3700-02, if desired, after ECCS setpoint is reached.			
	SRO	Directs actions of QGA 200.			
	BOP/ATC	Reports Torus level < 17 feet.			
	SRO	Directs Torus sprays prior to pressure reaching 5 psig.			
	BOP/ATC	Start torus sprays.			

Quad Cities			Scenario No.: 4	Event No.: 6	Page _5_ of _9_
Event Description:					
ATWS with ED required. Terminate and prevent RPV injection except for boron, CRD, and RCIC. The following failures occur:					
1) Failure of Main Turbine Bypass Valves;					
2) Failure of RHR Pumps;					
3) Failure of Torus vacuum breakers to close.					
Time	Position	Applicant's Actions or Behavior			
	BOP/ATC	Report Torus pressure > 5 psig.			
	BOP/ATC	Report Torus level < 17 ft.			
	BOP/ATC	Verify Recirc pumps and Drywell Coolers tripped.			
	SRO	Checks Drywell Spray Limit curve and orders DW sprays			
	BOP/ATC	Initiate Drywell Sprays.			
	BOP/ATC	Notes 1A and 1B RHR pumps have tripped, informs SRO, and contacts local Operator to investigate.			
	BOP/ATC	Reports 1C and 1D RHR pumps are degrading and refers to QCOP 1000-30 and QCOP 1000-02 to swap RHR pump suction to CCST's.			
	ATC	Notes containment is not working properly, reports Torus vacuum breakers are staying open.			
	SRO	Monitors PSP curve and Drywell temperature.			

Quad Cities Scenario No.: 4 Event No.: 6 Page _6_ of _9_

Event Description:

ATWS with ED required. Terminate and prevent RPV injection except for boron, CRD, and RCIC. The following failures occur:

- 1) Failure of Main Turbine Bypass Valves;
- 2) Failure of RHR Pumps;
- 3) Failure of Torus vacuum breakers to close.

Time	Position	Applicant's Actions or Behavior
	SRO	Enters QGA 500-1 to blowdown the vessel when PSP curve/Drywell temperature cannot be maintained.
	BOP/ATC	Monitor Torus temperature, torus level, and Containment Hydrogen and Oxygen levels.
	SRO	Monitors PCPL curve.
	SRO	Orders injection sources from outside primary containment secured, except those needed for core cooling or to shutdown the reactor.
	SRO	Directs actions of QGA 500-1/101 Pressure/Level.
	BOP/ATC	Prevents all injection except Boron, CRD, and RCIC.
	BOP/ATC	Reports Torus level > 5 feet.
	BOP/ATC	Opens relief valves, leaves switches in MAN.
	SRO	Returns to ATWS level control in QGA 101.

Quad Cities			Scenario No.: 4	Event No.: 6	Page _7_ of _9_
Event Description:					
ATWS with ED required. Terminate and prevent RPV injection except for boron, CRD, and RCIC. The following failures occur:					
1) Failure of Main Turbine Bypass Valves;					
2) Failure of RHR Pumps;					
3) Failure of Torus vacuum breakers to close.					
Time	Position	Applicant's Actions or Behavior			
	BOP/ATC	Reinjects to RPV pressure <MAFP.			
	BOP/ATC	Monitor RPV depressurization.			
	SRO	Directs actions of QCOP 1600-13 Post Accident Venting of thin Primary Containment prior to exceedeg PCPL.			
	BOP/ATC	Operate as many Turbine Building and Radwaste exhaust fans as possible for dilution flow.			
	BOP/ATC	Verify containment vent valves closed.			
	SRO	Reports to crew that it is OK to exceed release rate limits.			
	BOP/ATC /SRO	Announce evacuation of the Reactor Building and Turbine Building.			
	BOP/ATC	Place MASTER VENT MODE SWITCH in APCV position.			
	BOP/ATC	Verify closed AO 1-1699-7, VENT TO RX BLDG.			

Quad Cities			Scenario No.: 4	Event No.: 6	Page 8 of 9
Event Description:					
ATWS with ED required. Terminate and prevent RPV injection except for boron, CRD, and RCIC. The following failures occur:					
1) Failure of Main Turbine Bypass Valves;					
2) Failure of RHR Pumps;					
3) Failure of Torus vacuum breakers to close.					
Time	Position	Applicant's Actions or Behavior			
	BOP/ATC	Place AO 1-1601-24 CIS OVERRIDE in the OVERRIDE position and hold for 1 second.			
	BOP/ATC	Open AO 1-1601-24, VENT TO RX BLDG EXH SYS.			
	BOP/ATC	Verify Torus level is < 30 ft.			
	BOP/ATC	Open AO 1-1601-60, TORUS 18-INCH VENT VLV.			
	BOP/ATC	Open AO 1-1699-6, VENT TO MAIN CHIMNEY.			
	BOP/ATC	Monitor 1/2-1705-19, CHIMNEY GAS ACTIVITY recorder on Panel 912-4 and 1/2-1740-202, MN CHIMNEY GAS ACTIVITY recorder on 912-1 for proper operation.			
	BOP/ATC	Will log the following information in the Unit Log Book: - Time of vent start and stop; - Drywell and Torus pressure at time of vent start and stop.			
	SRO	Declares E-Plan.			

