

Exelon Nuclear

2019-301 ILT NRC Exam Scenario

Scenario Number:

NRC Scenario 1

Revision Number: 00

Date: 05/28/2019

Developed by: _____
Instructor Date

Validated by: _____
SME or Instructor Date

Reviewed by: _____
Operations Facility Representative Date

Approved by: _____
Training Department Date

Facility: Quad Cities Scenario: **2019-301 NRC Scenario 1** Op-Test No.: ILT 19-301
Examiners: _____ Operators: _____

Initial Conditions:

The plant is operating at 80% power with Drywell Spray Valve 23A is inoperable, Day 2 of a 7-Day of TLCO 3.6.a Condition a. 2A SW Pump and 1B EHC Pump are OOS.

Turnover: Start the third RFP. Return to full power.

Event No.	Malf. No.	Event Type*	Event Description
1	None	BOP N	Start a third Reactor Feed Pump IAW QOP 3200-03
2	None	ATC R	Normal Power up IAW REMA
3	RM05B	SRO TS	"B" Drywell Rad Monitor Upscale Failure TS
4	ED08Q	SRO TS	MCC 30 Feed Breaker trip on overcurrent TS
5	MC08	ATC C	Loss of Main Turbine Vacuum/ Emergency Power Reduction
6	RR10A	BOP C	Slow Recirc Leak resulting in a Scram
7	RR10A	Crew M	High Drywell Pressure results in entry into QGA 100 and 200.
8	HP11	BOP C	HPCI fails to initiate automatically. BOP must start HPCI manually.
9	DIHS11001S17B	Crew M	Div 2 Drywell Spray valves fail to open, Emergency Depressurization per QGA 500-1 when PSP exceeded
10		Crew M	Reference leg flashing results in entry into QGA 500-4

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

ES-301-4 Quantitative attributes:

Total Malfunctions (5-8): **7**
Malfunction(s) after EOP (1-2): **E8, 9**
Abnormal Events (2-4): **E5, 6**
Major Transient(s) /E-Plan entry (1-2): **E7**
EOPs (1-2): **QGA 100, 200**
EOP Contingencies (0-2): **QGA 500-1, 500-4**
Critical Tasks (2-3): **2**

ES-301-5 Quantitative attributes:

BOP Normal: **E1**
ATC Reactivity (1 per set): **E2**
BOP I/C (4 per set): **E6, E8**
ATC I/C (4 per set): **E5**
SRO-I I/C (4 per set inc 2 as ATC): **E5, 6, 8**
SRO Tech Spec (2 per set): **E3, 4**
ALL Major Transients (2 per set) **E6**

SUMMARY:

- Initial Conditions:
Drywell Spray Valve 23A is inoperable, Day 2 of a 7-Day LCO
2A SW Pump is OOS
1B EHC Pump is OOS
- Event 1: The BOP will start a third Reactor Feed Pump IAW QOP 3200-03.
- Event 2: Raise Reactor Power using REMA.
- Event 3: "B" Drywell Rad Monitor Upscale Failure (TS). The BOP and SRO respond per QCAN 901-56 A-1 and Technical Specifications 3.3.3.1 Condition A and 3.3.6.1 Condition A.
- Event 4: MCC 30 Feed Breaker trips. Report from EO is that the breaker tripped on overcurrent. SRO enters TS 3.7.9.A.
- Event 5: An air leak will result in lowering Main Condenser Vacuum. The crew performs QOA 3300-02 and Emergency Power Reduction. Prompt action by Equipment Operators to re-fill a loop seal line will stabilize Main Condenser Vacuum.
- Event 6: A Recirc leak will develop in the Drywell causing Drywell Pressure to rise resulting in BOP performing actions of QCOA 201-01. Drywell pressure will stabilize when the 7th drywell cooler is started
- Event 7: Recirc Leak will become larger causing drywell pressure to rise at a greater rate. When Drywell Pressure reaches scram criteria, ATC will SCRAM the Reactor. All three Reactor Feed Pumps will trip when the Scram has been inserted. SRO will enter QGA 100 and 200.
- Event 8: HPCI will fail to start automatically at 2.5# drywell pressure. BOP must start HPCI manually IAW QCOP 2300-06.
- Event 9: When Division 2 Containment Spray valves cannot be opened, the crew must Blowdown per QGA 200 and 500-1, in order to avoid exceeding Pressure Suppression Pressure (PSP).
- After Blowdown has commenced, the drywell will reach saturation conditions. The SRO will enter QGA 500-4 and flood the RPV to the Main Steam Lines.
- Approximate Run Time: 1.5 Hours

CRITICAL TASKS:

Critical Task #1 When Drywell temperature CANNOT be maintained < 280 F OR Torus pressure CANNOT be maintained < the Pressure Suppression Pressure Limit, (PSP), INITIATE an Emergency Depressurization..

Critical Task #2: When RPV Level cannot be determined, flood the RPV to the elevation of the Main Steam Lines.

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Scenario Number:

NRC Scenario 2Revision Number: 00Date: 05/28/2019

Developed by: _____
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Reviewed by: _____
Operations Facility Representative Date

Approved by: _____
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Appendix D

Scenario Outline

Form ES-D-1

Facility: Quad Cities Scenario No. **2019-301 NRC Scenario 2** Op-Test No. ILT 19-301

Examiners: _____ Operators: _____

Initial Conditions:

A normal plant shutdown is in progress currently at 75% power.

Turnover: Reduce Recirc Flow to Lower Reactor power.

Event No.	Malf. No.	Event Type*	Event Description
1	None	ATC R	Reduce Recirc Flow to Lower Reactor power.
2	SER1494 AOTI324087	ATC C	Feed Pump Vent Fan degraded.
3	FW01A FW02	ATC C	1A RFP trips with the standby RFP failing to auto-start. ATC will start the 1C RFP per QCOA 3200-01
4	AD01D AD07D	BOP C	Stuck open relief valve (QCOA 0203-01) and Reactor Scram
5	RD13A	Crew M	Hydraulic ATWS. Crew Takes actions per QGA 101 to control reactor power, level and pressure.
6	RD27C	ATC C	Running CRD pump trips. ATC takes actions to start standby CRD pump

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

ES-301-4 Quantitative attributes:

Total Malfunctions (5-8): **5**

Malfunction(s) after EOP (1-2): **E6**

Abnormal Events (2-4): **E2, 3, 4**

Major Transient(s) /E-Plan entry (1-2): **E5**

EOPs (1-2): **QGA 100**

EOP Contingencies (0-2): **QGA 101**

Critical Tasks (2-3): **3**

ES-301-5 Quantitative attributes:

BOP Normal:

ATC Reactivity (1 per set): **E1**

BOP I/C (4 per set): **E4**

ATC I/C (4 per set): **E2, 3, 6**

SRO-I I/C (4 per set inc 2 as ATC): **E2, 3, 4, 6**

SRO Tech Spec (2 per set):

ALL Major Transients (2 per set) **E5**

SUMMARY:

- Initial Conditions:
 - The plant is operating at 75%.
 - Relief valve 3D Tailpipe Temperature is elevated and rising 1°F/Day.
- Event 1: The SRO and ATC reduce Recirc Flow to Lower Reactor power.
- Event 2: A Reactor Feed Pump vent fan will become degraded, requiring a shift to the alternate fan after receiving high temp alarms.
- Event 3: 1A RFP trips with a failure of 1C RFP auto-starting. ATC will take actions per QCOA 3200-01 to start the 1C RFP and perform Emergency Power Reduction if necessary to maintain RWL.
- Event 4: The D Relief Valve will actuate and stick open. The crew responds per QCOA 0203-01 and scram the reactor prior to exceeding 95°F Torus Water Temperature. The Relief valve will close after the ATWS.
- Event 5: When the ATC inserts a manual scram no control rods will insert. The crew will recognize they are in a hydraulic ATWS and enter QGA 100, "RPV Control" and then they will rapidly transition to QGA 101 "RPV Control (ATWS)". The crew will attempt to insert control rods per QCOP 0300-28, but they will have little success beyond driving individual driving rods. The SRO will enter the Level/Power Control section of QGA 101 and lower reactor level to control reactor power.
- Event 6: After entry into QGA 101, the running CRD pump will trip. ATC will take actions per QCOA 0300-01 to start the standby CRD pump.
- Approximate Run Time: 1 Hour

- Critical task #1:** With a reactor scram required and the reactor not shutdown, TAKE ACTION TO REDUCE POWER by injecting boron (prior to exceeding 110°F torus temperature) and/or inserting control rods, to prevent exceeding primary containment design limits. (BWROG RPV-6.1 ATWS PWR/LVL S/D REACTOR)
- Critical task #2:** With a reactor scram required and the reactor not shutdown, and conditions for ADS blowdown are met, INHIBIT ADS to prevent an uncontrolled RPV depressurization, to prevent causing a significant power excursion. (BWR RPV-6.2 ATWS PWR/LVL INHIBIT ADS)
- Critical task #3:** During an ATWS with conditions met to perform power/level control, TERMINATE AND PREVENT INJECTION, with the exception of boron, CRD and RCIC into the RPV until conditions are met to re-establish injection. (BWROG RPV-6.3 PWR/LVL TERM/PREVENT)