**Appendix D** **Scenario Outline** **Form ES-D-1**

Facility: Quad Cities Scenario No.: **2016 NRC Scenario 1** Op-Test No.: ILT 14-1
Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions:
The plant is operating at 75% power.
RCIC steam line is isolated.

Turnover: Return RCIC to the standby lineup.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | None | BOP N | Re-pressurize the RCIC Steam Lines |
| 2 | SW07B | BOP C | The 1B RBCCW Pump degrades (QCOP 3700-02) |
| 3 | FW06B | ATC I | Feedwater Flow Transmitter Failure |
| 4 | PC04G | SRO | Drywell-Torus Vacuum Breaker fails open **TS** |
| 5 | RR01A | ATC R | 1A Recirc Pump Trip / Emergency Power Reductions (QCOA 0202-04) **TS** |
| 6 | RR11A | CREW M | LOCA- Recirc Loop A Discharge Pipe Break TAF-Blowdown (QGA 100/200/500-1) |
| 7 | ED03B/ED04B | ATC C | Loss of Reactor Feed Pumps |
| 8 | DG04A | BOP C | U-1 EDG fails to auto start |
| 9 | HP01/RC01 | CREW C | HPCI Startup and Trip / RCIC Trip |

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

ES-301-4 Quantitative attributes:
Total Malfunctions (5-8): 8
Malfunction(s) after EOP (1-2): **E7, 8, & 9**
Abnormal Events (2-4): **E2, 3, 4, & 5**
Major Transient(s) /E-Plan entry (1-2): **E6**
EOPs (1-2): **QGA 100 & 200**
EOP Contingencies (0-2): **QGA 100/500-1**
Critical Tasks (2-3): **3**

ES-301-5 Quantitative attributes:
BOP Normal: **E1**
ATC Reactivity (1 per set): **E5**
BOP I/C (4 per set): **E2 & 8**
ATC I/C (4 per set): **E3 & 7**
SRO-I I/C (4 per set inc 2 as ATC):
**E2, 3, 5, 7, 8, 9**
SRO Tech Spec (2 per set): **E4 & 5**
ALL Major Transients (2 per set) **E6**

**Appendix D** **Scenario Outline** **Form ES-D-1**

Facility: Quad Cities Scenario No.: **2016 NRC Scenario 2** Op-Test No.: ILT 14-1
Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions:
The plant is operating at 50% power. Power was lowered due to Load Following for Grid Stability. Work on the Nelson-345KV Junction is completed. The Unit is returning to full power. 1B Service Water Pump and 1A Stator Cooling Water pump are out of service for repair.

Turnover:
Reverse Main condenser flow and raise power to 100% per ReMA instructions.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | None | BOP N | Reverse Main Condenser flow |
| 2 | None | ATC R | Raise power after Load Following |
| 3 | RD02R2255 | ATC C | Recoverable Stuck Rod / Raise CRD Drive Pressure (QCOA 0300-02) |
| 4 | RM05B | SRO | "B" Drywell Rad Monitor Upscale Failure **TS** |
| 5 | NM10A | ATC I | RBM Channel 7 fails high **TS** |
| 6 | dihs15401 close | BOP C | SJAE suction valves fail shut. BOP recovers them by QOA 901-7 A-14 actions. |
| 7 | TU02A | BOP C | Main Turbine high vibration (Leading to Turbine Trip) |
| 8 | RD 13A (Hydraulic ATWS) | Crew M | ATWS. No rod motion. The Crew will take actions per QGA 101 to control reactor power, level and pressure. The crew will utilize Level/Power control (EPG Contingency #5) to lower power. |
| 9 | RP10A(B) | ATC C | The Group III (RWCU) fails to actuate. The ATC will manually isolate RWCU. |

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

ES-301-4 Quantitative attributes:
Total Malfunctions (5-8): **6**
Malfunction(s) after EOP (1-2): **E9**
Abnormal Events (2-4): **E3, 5, 6, & 7**
Major Transient(s) /E-Plan entry (1-2):**E8**
EOPs (1-2): **QGA 100 and 101**
EOP Contingencies (0-2): **1**
Critical Tasks (2-3): **4**

ES-301-5 Quantitative attributes:
BOP Normal: **E1**
ATC Reactivity (1 per set): **E2**
BOP I/C (4 per set): **E6 & 7**
ATC I/C (4 per set): **E3, 5 & 9**
SRO-I I/C (4 per set inc 2 as ATC):
**E3, 5, 6, 7, 9**
SRO Tech Spec (2 per set): **E4 & 5**
ALL Major Transients (2 per set) **E8**

**Appendix D** **Scenario Outline** **Form ES-D-1**

Facility: Quad Cities Scenario No.: **2016 NRC Scenario 3** Op-Test No.: ILT 14-1
Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions:
The plant is operating at 100% power. Maintaining full power. 1B Service Water Pump and 1A Stator Cooling Water pump are out of service for repair.

Turnover:
Swap running EHC pumps for upcoming maintenance.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | None | BOP N | Swap running EHC pumps per QCOP 5650-01 Step F.4 |
| 2 | SW02A (degraded) | BOP C | 1A Service Water pump degrades resulting in swapping to standby pump per QCAN 912-1 B-3. |
| 3 | None (cued) | BOP C | 1C RFP bearing failure requiring shutdown of the 1C RFP |
| 4 | None | ATC R | Emergency power reduction, per QCGP 3-1 step F.1, to secure 1C RFP |
| 5 | NM08A | ATC I | APRM channel 1 fails "As Is" during Emergency Power reduction **TS** |
| 6 | zdihs11300rm(1) | BOP C | RCIC spurious start and subsequent manual trip from MCR **TS** |
| 7 | HP12<br>HP13<br>CR01<br>CR02 | CREW M | Fuel failure and HPCI steam line break. Crew enters QGA 300 and transitions to QGA 500-1 when two areas exceed Max Safe radiation levels. |
| 8 | NM03A-D<br>NM07A-H | ATC I | SRMs and IRMs fail to automatically insert. The ATC will manually insert them per QCGP 2-3 and QCOP 0700-01 guidance |

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

ES-301-4 Quantitative attributes:
Total Malfunctions (5-8): **6**
Malfunction(s) after EOP (1-2): **E8**
Abnormal Events (2-4): **E2, 3, 5, & 6**
Major Transient(s) /E-Plan entry (1-2):**E7**
EOPs (1-2): **QGA 100, 300, and 500-1**
EOP Contingencies (0-2): **1**
Critical Tasks (2-3): **2**

ES-301-5 Quantitative attributes:
BOP Normal: **E1**
ATC Reactivity (1 per set): **E4**
BOP I/C (4 per set): **E2, 3, & 6**
ATC I/C (4 per set): **E5 & 8**
SRO-I I/C (4 per set inc 2 as ATC): **E2,3,5,6,8**
SRO Tech Spec (2 per set): **E5 & 6**
ALL Maior Transients (2 per set) **E7**

**Appendix D** **Scenario Outline** **Form ES-D-1**

Facility: Quad Cities Scenario No.: **2016 NRC Scenario 4** Op-Test No. ILT 14-1
Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions:
The plant is currently at 75% power and holding load per Generation Dispatch.
Turnover: Perform the Core Spray Monthly surveillance for the 1B Core Spray pump, and QCOS 1600-04, Weekly Primary Containment Oxygen Concentration from the 901-56 panel.

| Event No. | Malf. No. | Event Type* | Event Description |
|---|---|---|---|
| 1 | None | BOP N | Perform Core Spray Monthly Surveillance (1B Core Spray pump) |
| 2 | DIHS124AS6B | BOP C | Failure of 1B CAM to start for surveillance. **TS** |
| 3 | FW17C DIHS13302 | ATC C | 1C Condensate Pump trip w/failure of standby pump to auto-start. |
| 4 | None | SRO | SSMP Room Cooler inoperable. **TS** |
| 5 | DIHS156041A LOHS156041A | BOP C | 1A Gland Exhauster trip. |
| 6 | MC08 | ATC R | Loss of Main Condenser vacuum / Emergency Power Reduction |
| 7 | RP02 RP03 | ATC C | Electric ATWS (ARI inserts control rods) QGA 101. |
| 8 | MS04B | CREW M | Main Steam Line break inside the Drywell. QGA 100 and QGA 200. |
| 9 | DIHS11001S17B RH19AR | CREW C | Failure of Drywell Sprays (S-17B and RHR 23A valve). Blowdown QGA 500-1 |

* (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): **E2, 3, 5, 6**
Major Transient(s) /E-Plan entry (1-2): **E8**
EOPs (1-2): **QGA 100, 200**
EOP Contingencies (0-2): **QGA 500-1**
Critical Tasks (2-3): **2**

ES-301-5 Quantitative attributes:
BOP Normal: **E1**
ATC Reactivity (1 per set): **E6**
BOP I/C (4 per set): **E2 & 5**
ATC I/C (4 per set): **E3 & 7**
SRO-I I/C (4 per set inc 2 as ATC): **E2,3,5,7**
SRO Tech Spec (2 per set): **E2 & 4**
ALL Major Transients (2 per set) **E8**