ERCOT 2012 SEVERE WEATHER DRILL SCRIPT

# Event Simulating a Category 5 Hurricane

**DRILL PURPOSE:**

The ERCOT 2012 Severe Weather Drill is to provide TO, QSE, and ERCOT Operators with simulated emergency operations practice. It is anticipated that each operator participating in the Drill will:

* Practice communicating with other entities not only in events leading up to the Hurricane event (on May 22), but also appropriate restoration activities on the day of the Drill (on May 23)
* Have the opportunity to simulate the use of internal backup emergency plans
* Have the post-drill opportunity to determine lessons learned, to make needed changes to emergency and emergency operations plans, and to critique the Drill
* Have the opportunity to exercise other emergency centers within your organization.
* Have the opportunity to meet NERC & ERCOT Guides’ requirements for emergency training

**DRILL SCENARIO:**

*(8 Days Prior to Landfall)*

ERCOT begins tracking a Tropical Storm moving toward the Gulf of Mexico. The storm is 8 days away and currently tracking into the Gulf of Mexico with no specific landfall predictions.

*(7 Days Prior to Landfall)*

The storm is upgraded to a Category 1 hurricane. Hurricane May is predicted to make landfall on the Upper Louisiana Coast.

*(6 Days Prior to Landfall)*

Hurricane May is upgraded to a Category 2 Hurricane. Computer models are estimating landfall to be in the Upper Texas/Louisiana Coast.

***(5 Days Prior to Landfall)***

**0800/OPERATING CONDITION NOTICE**

**(0800 *Drill Time, May22th)***

*(8:00 a.m. Drill Day 1) Hurricane May is entering the Gulf of Mexico. May is located just off the Yucatan peninsula at 21.7 N, 088.8 W moving NW @ 15 MPH. May is a Category 4 storm with 140 mph winds and is expected to strengthen to a Category 5 hurricane over the next few hours. Computer models predict the probability of landfall along the Upper Texas/Louisiana Coast.*

***Drill Notes…***

ERCOT anticipates a severe shortfall of load, such that insecure system conditions are projected. ERCOT responds that by issuing an Operating Condition Notice, due to forecasted weather and system loads.

***TOs are instructed to:***

* Review Planned and existing transmission outages to be withdrawn and/or restored.
* Review emergency operating procedures, evacuation plans, and the possible need to staff backup facilities.

***QSEs are instructed to:***

* Review fuel supplies and notify ERCOT of any known or anticipated fuel restrictions.
* Review Planned Resource outages and consider delaying maintenance.
* Review emergency operating procedures and notify ERCOT of any changes or conditions that could affect System Reliability.

**0900/COMMUNICATIONS TESTING**

**(0900 *Drill Time, May22nd)***

**0900:** Test all communications systems between participating entities; this includes telephones, satellite phones, faxes, radios, internet communications, backup control centers, hotlines, and etc.

ERCOT will test the SSRG Hotline and initiate a Hotline Test Call. Call will be made at 09:30 SSRG roll call at 09:40

***(3 Days Prior to Landfall)***

**1030 / ADVISORY**

**(*1030 Drill Time, May 22nd*)**

***Drill Notes…***

*(10:30 a.m. Drill Day 1) Hurricane May is located at 23.0 N, 090.6 W moving NW @ 15 MPH. May is a minimal Category 5 hurricane with winds measured at 156 mph. Hurricane models have shifted landfall probabilities to the Mid-Texas coastline. A Hurricane Watch has been issued for the Texas coast from Brownsville to Port Arthur. Predictions indicate a 10% probability of landfall within the next 72 hours at Freeport, a 20% probability at Port Lavaca and a 10% probability at Corpus Christi.*

ERCOT issues an Advisory at 1030 to all TOs and QSEs. ERCOT instructs Market Participants to initiate internal storm response procedures, to include voluntary relocation to Backup Control Centers.

***Drill Action Items…***

***TOs are instructed to:***

* Review planned and existing transmission outages to be withdrawn and/or restored.
* Review emergency operating procedures, evacuation plans, and the possible need to staff backup facilities.
* Test communication with other TDSPs and QSEs prior to the hurricane making landfall.

***QSEs are instructed to:***

* Review fuel supplies and notify ERCOT of any known or anticipated fuel restrictions.
* Review Planned Resource outages and consider delaying maintenance.
* Review emergency operating procedures and notify ERCOT of any changes or conditions that could affect System Reliability.
* Direct plant operators to prepare for projected severe weather conditions and review procedures for operating in the lead due to possible high voltage concerns.
* Notify ERCOT if relocating personnel to Backup Control Centers.

***(2 Days Prior to Landfall)***

**Update on Hurricane May**

**(*1300 Drill Time, May 22nd)***

*(1300 Drill Day 1) Hurricane May is located at 24.7 N, 092.7 W moving NW @ 15 MPH. Hurricane May has become a dangerous Category 5 hurricane with winds clocked at 159 mph. A Hurricane Watch remains in effect for the Texas coast from Brownsville to Port Arthur. A Hurricane Warning has been issued for the Texas coast from Corpus Christi to Galveston. Predictions now indicate a 20% probability of landfall at Freeport, a 40% probability at Port Lavaca and a 20% probability at Corpus Christi within the next 48 hours.*

***Drill Action Items…***

***TOs are instructed to continue:***

* Reviewing the items listed under the Advisory.
* Notify ERCOT if relocating personnel to Backup Control Centers.

***QSEs are instructed to continue:***

* Reviewing the items listed under the Advisory.
* Notify ERCOT if relocating personnel to Backup Control Centers.

***(1 Day Prior to Landfall)***

**1530 / WATCH**

***(1530 Drill Time, May 22nd)***

***Drill Notes…***

*(3:30 p.m. Drill Day 1) Hurricane May is located at 26.6 N, 094.7 W moving NW @ 15 MPH. May has weakened to a Category 4 hurricane with 150 mph winds. The highest probability of landfall is now 75% at Port Lavaca by tomorrow morning. Hurricane force winds are expected to extend out 100 miles either side of the storm creating 15-20 foot storm surges as far north as Galveston and southward towards Port Aransas. A Hurricane Warning continues from Corpus Christi to Galveston. Once May makes landfall it is expected to weaken rapidly as it moves inland and then make a northerly turn as it collides with high pressure in West Texas.*

***Drill Action Items…***

***TOs are instructed to:***

* Be prepared to lose load and expect high voltage conditions as the hurricane approaches landfall.
* Keep ERCOT informed of any issues.

***QSEs are instructed to:***

* Notify all Resources of conditions
* Review fuel supplies and notify ERCOT of any known or anticipated fuel restrictions
* Review emergency operating procedures and notify ERCOT of any changes or conditions that could affect System Reliability.
* Make available, any Resources that can be returned to service and keep COPs and HSLs updated.

***LANDFALL***

**0800 / EMERGENCY NOTICE**

**(*0800 Drill Time, May 23rd)***

***Drill Notes…***

Hurricane May makes impact at approximately 0800 at around Port Lavaca, Texas. High winds and heavy rain are occurring between Corpus Christi and Lake Jackson. Storm surges of 8-14 feet are reported. Separately, the latest reports by QSEs on fuel availability lead ERCOT to conclude that severe fuel supply shortages will exist during and following the event.

*(08:00 a.m. Drill Day 2) Hurricane May is located at 28.3 N, 096.2 W moving NNW @ 15 MPH. May is moving ashore near Port Lavaca, Texas as a Category 4 storm with 135 mph winds. May is expected to turn to a more Northerly path and rapidly lose strength.*

ERCOT issues an Emergency Notice at 0800 to all TOs and QSEs, due to weather conditions, high voltage, and fuel curtailments.

*Drill Action Items…*

***TOs are instructed to:***

* TOs prepare to lose load and expect high voltage conditions as the storm moves island.
* Keep ERCOT informed of any issues.

***QSEs are instructed to:***

* Be prepared to reduce generation output due to anticipated load loss and respond to voltage support issues as requested.
* Keep COPs and HSLs current.

**LANDFALL**

**& SEVERE WINDS**

**(*0900 Drill Time, May 23rd)***

***Drill Notes…***

Hurricane May wind is gusting up to 140 mph, and there are unconfirmed reports of associated severe tornadic activity. TOs report momentary transmission line operations to ERCOT, as well as some severe isolated forced outages. ERCOT’s reserves currently are adequate, as load is decreasing rapidly. Communications/telemetry between certain QSEs and ERCOT have been lost, forcing those QSEs’ resources to communicate/operate directly with ERCOT and/or local TOs.

***Drill Action Items…***

* Resources that have disconnected from their QSEs are to immediately report status to ERCOT and/or local TOs, and to await further instruction

**TORNADOES & TRANSMISSION/SUB-STATION DAMAGE**

**(*0900 Drill Time, May 23rd)***

***Drill Notes…***

Hurricane May is currently moving at approximately 15 mph toward Interstate 10 and is currently over Victoria, Texas.

TOs are reporting lines down, due to winds and unknown numbers of tornadoes. Line crews along the coast have evacuated and assembled inland, but are presently unable to respond, as travel is extremely dangerous. Support personnel are severely limited ERCOT-wide at TOs, Generation Resources, and QSE Control Centers, due to massive evacuations the preceding two-three days.

***Drill Action Items…***

* TOs observing line and substation outages should immediately report status to ERCOT
* QSEs observing any changes to Resource operations, including equipment damage incurred, should immediately report status to ERCOT

**Landfall Day 1400**

**INLAND MOVEMENT**

***(1030 Drill Time, May 23rd)***

***Drill Notes…***

The Hurricane May is now over moving inland at 10 mph on a north easterly latitude, forecasted to move just east of Austin, then directly into Dallas-Fort Worth. Additional tornadoes have been reported.

*(10:30 a.m. Drill Day 2) Hurricane May is located at 30.5 N, 096.9 W moving N @ 10 MPH placing it on a course toward Dallas. May has weakened to a Category 1 Hurricane with winds of 81 mph and is expected to weaken to Tropical Storm strength within several hours.*

TOs confirm widespread transmission line and substation damage, as well as other transmission lines that are galloping. Several major transmission lines have been forced out of service in the Central Texas area. Momentary operations on transmission lines are turning up in several areas. TOs are reporting that some of these lines may have to be forced out.

Communications/telemetry between additional QSEs and ERCOT has been lost, forcing those QSEs’ resources to communicate directly with ERCOT and/or local TOs/TDSPs.

***Drill Action Items…***

* TOs experiencing momentary line operations and forced line outages should report status back to ERCOT
* QSEs observing any changes to Resource operations, including equipment damage incurred, should immediately report status back to ERCOT
* Resources that have disconnected from their QSEs are to immediately report status to ERCOT and/or local TOs/TDSPs, and to await further instruction

**Landfall Day 1600**

**INLAND MOVEMENT**

***(1100 Drill Time May 23rd)***

***Drill Notes…***

Load has been lost along the coast, and north through the Austin-Temple corridor, as the Hurricane moves further inland. The Hurricane has weakened now to a Category-1 storm, as 75-90mph winds gusts are observed. Reports are now coming in that severe coastal flooding has taken numerous refineries, pipelines, and compressor stations out of service.

TOs report numerous outages on distribution circuits, due to severe winds. Central Texas has multiple 345 KV transmission line forced out, along with many other 138 KV lines.

A high pressure front building in the West is causing an increase in wind generation which is creating West to North overloads and stability issues.

Fuel curtailments in other areas have continued to increase, causing further generation capability reductions.

***Drill Action Items…***

* TOs must report status of transmission outage(s) and/or substation damage to ERCOT
* TOs to assess and report customer outages to ERCOT (per DOE Form 417)
* QSEs observing fuel curtailments (and generation reductions) must report status to ERCOT, to include submitting Fuel Reporting Form(s) to ERCOT
* QSEs must revise/update Resource Plans to reflect impact of fuel curtailments
* QSEs observing any changes to resource operations, to include equipment damage incurred, should immediately report status to ERCOT
* Resources that have disconnected from their QSEs are to immediately report status to ERCOT and/or local TOs and to await further instruction

**Landfall Day 1800**

**STORM IN CENTRAL TEXAS**

**(*1130 Drill Time May 23rd)***

***Drill Notes…***

ERCOT determines that certain localized areas are operating in an emergency condition, due to fuel curtailments, dropping load, voltage instability, galloping conductors, additional 69 KV and 138 KV outages. Widespread line outages continuing to occur, while other Resource facilities have been isolated due to lack of transmission availability.

***Drill Action Items…***

* ERCOT deploys additional, available DBES
* ERCOT requests TOs/TDSPs to assess transmission availability at Resource facilities, and report status to ERCOT
* ERCOT requests TOs/TDSPs to assess/report transmission capability
* ERCOT notifies all appropriate QSEs to assess readiness/availability of Blackstart and RMR resources
* QSEs should re-start specific/available resources, as load recovers (per pre-existing bilateral agreements)
* QSEs observing fuel curtailments (and generation reductions) must report status to ERCOT
* QSEs must revise/update Resource Plans to reflect impact of fuel curtailments, equipment failure(s)
* QSE-Resources disconnected from their QSEs are to continue attempting to re-connect with their QSEs, and report status back to ERCOT
* Drill Participants should be practicing internal restoration activities and interacting as appropriate with ERCOT, during this stage of the Drill

**Landfall Day 2100**

**STORM IN NORTH TEXAS**

***(1300 Drill Time May 23rd)***

***Drill Notes…***

*(1300 Drill Day 2) Tropical Storm May is located at 33.0 N, 096.8 W moving NNE @ 4 MPH. May has been downgraded to a Tropical Storm with winds of 56 mph. May is expected to remain almost stationery and dump up to 15 inches of rain per hour throughout the evening.*

Severe rain, wind, and flooding is widespread. Meanwhile, ERCOT’s load is still falling, too much generation remains online, and high voltage remains a problem. The hurricane has been downgraded to a Tropical Storm, as sustained winds are well below 75 mph now, but it has entered the Dallas-Fort Worth area. Even as winds have decreased – occasional gusts are exceeding 60 mph – TOs continue to observe galloping conductors. System load is still falling, and frequency is climbing.

***Drill Action Items…***

* ERCOT requests TOs assess/report transmission capability
* TOs implement Block Load Transfer (BLT) plans, for load restoration, if needed
* QSE-Resources disconnected from their QSEs are to continue attempting to re-connect with their QSEs, and report status back to ERCOT
* Drill Participants should be practicing internal restoration activities and interacting as appropriate with ERCOT, during this stage of the Drill

**Landfall Day 2300**

**STORM IN OKLAHOMA**

**(*1400 Drill Time May 23rd)***

***Drill Notes…***

Hurricane conditions within Texas have improved, as loss of load has peaked. However, rain, wind, and flooding continue in most areas. Winds are now in the 15-20 mph range. Transmission/distribution outages, coastal infrastructure outages, and certain QSE outages all persist, at this time. TOs/TDSPs and QSEs are assessing facility damage, while restoration of load continues. Tropical Storm May is located 75 miles south of the Oklahoma border.

***Drill Action Items…***

* QSEs re-connected to their Resources are to immediately report status to ERCOT
* Drill Participants should be practicing internal restoration activities and interacting as appropriate with ERCOT, during this stage of the Drill

**Landfall Day +1, 0100**

**HURRICANE CONDITIONS IMPROVING**

**(*1430 Drill Time*)**

*Drill Notes…*

ERCOT has sufficient room to move down for its reduced loads. Very limited gas curtailments have been lifted, as infrastructure along the coast has sustained extensive damage. Separately, transmission line/substation damage is massive, but TDSP/TO line crews have begun repair/restoration efforts.

*Drill Action Items…*

* QSEs should re-start specific/available resources, as load recovers (per pre-existing bilateral agreements)
* QSEs to revise/update RPs, as appropriate
* Drill Participants should be practicing internal restoration activities and interacting as appropriate with ERCOT, during this stage of the Drill

**Landfall Day +1, 0200**

**HURRICANE CONDITIONS IMPROVING**

**(*1500 Drill Time*)**

*Drill Notes…*

Additional gas curtailments have been lifted, though there is still undetermined damage to offshore production and coastal infrastructure facilities.

The Central and South Texas transmission lines that were lost are being restored to service. Damage to other 69 kv and 138 kv lines along the coastal plain will keep these particular lines out of service for a still unspecified period of time.

ERCOT reviews latest Resource and TO data, and determines that ERCOT is in a secure state.

***Drill Action Items…***

* TOs to report status of line outages back to ERCOT
* QSEs instructed to report status of fuel restoration(s) back to ERCOT, and update RPs as appropriate
* Drill Participants should be practicing internal restoration activities and interacting as appropriate with ERCOT, during this stage of the Drill

**(2012 SEVERE WEATHER DRILL OVER)**

**ALL PARTICIPANTS MUST REVIEW AND CRITIQUE DRILL INTERNALLY, THEN PROVIDE WRITTEN CRITIQUE TO ERCOT BY *MAY 31st***