

# Operations Training Working Group (OTWG)

January 11th, 2018

ERCOT 800 Airport Drive, Taylor, Building TCC 1, Room 252/WebEx

1300-1600

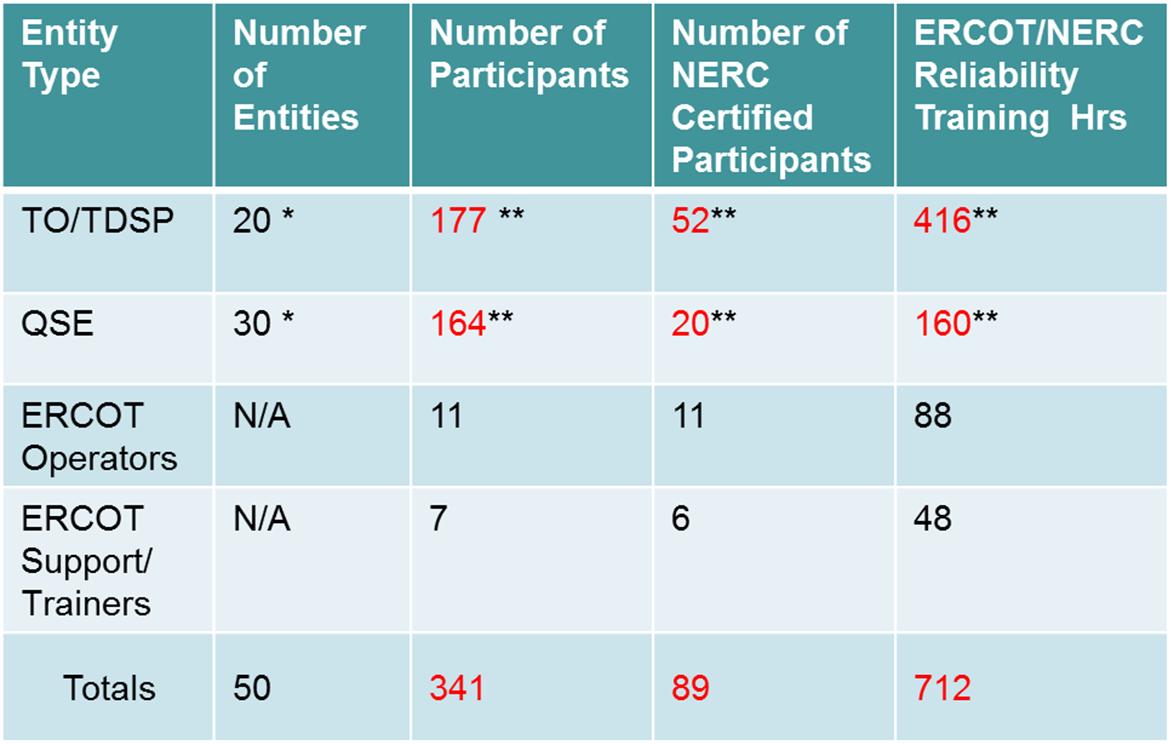
* Anti-trust Admonition

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* Disclaimer

All presentations and materials submitted by Market Participants or any other Entity to ERCOT staff for this meeting are received and posted with the acknowledgement that the information will be considered public in accordance with the ERCOT Websites Content Management Operating Procedure.

* Approval of Meeting Notes – December 2017
* Winter Storm Drill (Oct 18/19)
  + Completed Winter Storm Drill. CEHs for the Winter Storm Drill have been administered.
  + ERCOT’s biennial Winter Storm Drill was executed successfully with four major objectives:
    - Test ERCOT System Operations, QSE’s and TO’s serving the ERCOT region for their ability to recognize the current state of the system, given a set of conditions;
    - Given a sequence of events, test appropriate response to changing system conditions;
    - As warranted by system conditions, test communication of information with relevant personnel;
    - Test demonstration of proper three-part communication.
  + Winter Storm Drill Participants



* + The drill included simulations such as;
    - High winds and icing shutting down wind units
    - Control transmitters freezing causing a loss of fossil generation
    - Galloping conductors tripping lines
    - Gas curtailments causing loss of some generation and reduced output of others.
    - Boiler tube leaks
    - Loss of other transmission elements not necessarily related to the storm for the purpose of achieving EEA 1, 2 and 3 conditions.
  + Winter Storm Drill Comments
    - ERCOT experienced issues several issues with the Consortium system during Day1 hotline calls forcing ERCOT operators to make some individual hotline calls to participants.
    - The original script timelines which were sent out with the market notice did not match with the Day 1 timeline.
    - Overall, the MMAP refresher received much praise for timeliness.
    - The ERCOT Operators had favorable response to the simulation. They stated that it was important to them to step through the procedures, take actions and see the impacts.
    - One operator stated that he failed to predict PRC response to deployment actions of load resources done to restore frequency and it was important that he understand that impact.
    - Overall the Market Participant Operators stated it was a good exercise and simulation to test our response to real-world events.
    - The also stated it was an excellent simulation of real system emergency conditions.
    - There were some problems programming events in the simulator.
    - Request to have a little more detail on the timeline of weather events
    - Although majority of participants expressed value using MMAP for this type of simulation, suggestions were received in areas for enhancement:
    - Alarm log for TO’s to view individual lines as they go out
    - State Estimator tool in the MMAP
    - MMAP default to showing de-energized lines and wall board colors
    - Would like more time committed to learning Macomber Map.
* Grid Ex IV Drill (Nov 15/16)
  + Included simulated cyber & physical events in our Operator Training Simulator (OTS) and including Market Participants
  + Included Cyber Proving Grounds / Test Bed
  + Server and Workstations representative of our environment
  + Participants
    - AEP
    - Austin Energy
    - Avangrid
    - Calpine
    - City of Garland
    - CPS Energy – TO/QSE
    - Duke Energy
    - LCRA – TO / QSE
    - Formosa
    - MP2 Energy
    - NRG
    - ONCOR
    - TNMP
    - Sharyland Utilities
    - Rayburn Electric Cooperative
  + Day 1 Simulation included:
    - Some unrelated generator and line trips.
    - Gas Company reported that a pumping station had been attacked
    - Several physical attacks occurred to transmission elements which included cutting down trees in the ROW.
    - Attacks on generators included a UAV attack on the fuel at coal plant
    - A car was rammed into the gas supply of a combined cycle plant.
    - An attack on a Transmission Operator Back up control center, where a car was abandoned with flammable materials and ignited.
    - Cyber attacks included a software update conducted on generator control systems causing some generators to become uncontrollable and required manual tripping.
  + Day 2 Simulation included:
    - Structures collapsed due to explosives
    - Trees cut in Right of Ways
    - Fires set in Right of Ways
    - Insulators shot out
    - Linemen shot at
    - Generators still impacted by gas curtailments
    - UAV attacks
    - A cyber attack impacted the ICCP link for a Transmission Operator which impacts the ERCOT’s EMS.
  + Grid Ex IV Comments
    - Overall the Exercise was a success
    - There were many instances of great teamwork and collaborative troubleshooting.
    - Market Participants and ERCOT Operators showed they were extremely skilled, in fact the teams had to be sabotaged to slow them down so the full effect of the event could play out. They adapted quickly to changing conditions.
    - A more extensive documentation of events will ensure that all players are identified and allow the players to fully explore incident to the logical conclusion. This will allow for:
    - Better indications to prevent an undesired outcomes
    - Ensure equipment requirements met for operation, troubleshooting and recovery
    - Better identification of communication requirements and tools
    - Ensure planners have clear roles
    - Improve coordination and minimize deviations from the MSEL.
    - Simulator case was not fully groomed, which required instructors to perform switching which was misidentified as cyber-attacks.
    - Due to limited size and technology of wall display, operators were tipped off to some events due to the changes in the display
    - Some Modeled elements have incorrect ownership
    - MMAP does not default to showing de-energized lines and wall display colors
    - MMAP does not have logging capability so the Operators can see the events for their system.
* 2018 Black Start Training
  + 2018 Black Start and Restoration Training Schedule
    - Pilot
      * Generator and Transmission System Dynamics (10 CEHs) January 8th 12 pm – 5 pm and January 9th 7 am to 12 pm
      * Black Start and Restoration Course (19 CEHs)

January 9th 1pm to 5pm, January 10th 7am – 5pm, January 11th 7 am – 12 pm.

* + - Session 1
      * Generator and Transmission System Dynamics (10 CEHs) January 29th 12 pm – 5 pm and January 30th 7 am to 12 pm
      * Black Start and Restoration Course (19 CEHs)

January 30th 1pm to 5pm, January 31st 7am – 5pm, February 1st 7 am – 12 pm.

* + - Session 2
      * Generator and Transmission System Dynamics (10 CEHs) February 5th 12 pm – 5 pm and Februatry 6th 7 am to 12 pm
      * Black Start and Restoration Course (19 CEHs)

February 6th 1pm to 5pm, February 7th 7am – 5pm, February 8th 7 am – 12 pm.

* + - Session 3
      * Generator and Transmission System Dynamics (10 CEHs) February 12th 12 pm – 5 pm and February 13th 7 am to 12 pm
      * Black Start and Restoration Course (19 CEHs)

February 13th 1pm to 5pm, February 14th 7am – 5pm, February 15th 7 am – 12 pm.

* + - Session 4
      * Generator and Transmission System Dynamics (10 CEHs) February 19th 12 pm – 5 pm and January 20th 7 am to 12 pm
      * Black Start and Restoration Course (19 CEHs)

February 20th 1pm to 5pm, February 21st 7am – 5pm, February 22nd 7 am – 12 pm.

* + - Session 5
      * Generator and Transmission System Dynamics (10 CEHs) February 26th 12 pm – 5 pm and February 27th 7am to 12 pm
      * Black Start and Restoration Course (19 CEHs)

February 27th 1pm to 5pm, February 28th 7am – 5pm, March 1st 7 am – 12 pm.

* + - Session 6
      * Generator and Transmission System Dynamics (10 CEHs) March 5th 12 pm – 5 pm and March 6th 7 am to 12 pm
      * Black Start and Restoration Course (19 CEHs)

March 6th 1pm to 5pm, March 7th 7am – 5pm, March 8th 7 am – 12 pm.

* + - Inclement Weather Session
      * Generator and Transmission System Dynamics (10 CEHs) March 12th 12 pm – 5 pm and March 13th 7 am to 12 pm
      * Black Start and Restoration Course (19 CEHs)

March 13th 1pm to 5pm, March 14th 7am – 5pm, March 15th 7 am – 12 pm.

* 2018 OTS (Length 18 hours / 16 CEHs)
  + Theme

Generators, Markets and Transmission, Working Together to Ensure Reliability

* + Tuesday
    - 10a CEO Introduction (Bill Magness / ERCOT)
    - 11a Extreme Natural Events (1 CEH) (Kristi Hobbs / ERCOT)
  + LUNCH
    - 1p Hurricane Harvey (3 CEH)
      * Weatherman Perspective (Chris Coleman)(50 min)
      * CenterPoint Perspective (CenterPoint)(30 min)
      * AEP Perspective (AEP)(30 min)
      * NRG Perspective (NRG)(30 min)
      * ERCOT Perspective (ERCOT Operations Management)(30 min)
    - 4p Resource Integration Impacts (1 CEH) (John Bernecker / ERCOT)
  + Wednesday
    - 8a Markets and Reliability (1 CEH) (David Maggio / ERCOT)
    - 9a Grid Scale Renewables: Planning, Operations and Forecasting (1 CEH) (Nitika Mago / ERCOT)
    - 10a Trends in Markets and Policy: Texas and Beyond (1 CEH) (Paul Wattles)
    - 11a Distributed Energy and Demand Response (1 CEH) (Clayton Stice / ERCOT)
  + LUNCH
    - 1p RUC Process (1 CEH) (Agee Springer / ERCOT)
    - 2p Improving Resiliency – What can be done? (1 CEH) (John Adams / ERCOT)
    - 3p Loss of SCADA, EMS, or LCC (1 CEH) (Dave Penney / TRE, Mark Henry / TRE, Ray Manzanilla / ERCOT)
    - 4p Coordinated Voltage Control (Voltage set point control) (RPC) (1 CEH) (Stephen Solis / ERCOT)
  + Thursday
    - 8a Human Performance Improvement (1 CEH) (Brian Legg / ERCOT)
    - 9a Physical and Cyber Security (1 CEH) (Joshua Aldridge / ERCOT)
    - 10a Australian Black Out Event (1 CEH) (Alex Lee / ERCOT)
    - 11a Seminar Assessment - Scantron assessment
    - 12p CLOSING and Mementos
  + Schedule (Austin Airport Hilton)
    - Pilot – January 23rd – 25th
    - Session 1 – March 27th – 29th
    - Session 2 – April 3rd – 5th
    - Session 3 – April 10th – 12th
    - Session 4 – April 17th – 19th
    - Session 5 April 24th – 26th
    - Session 6 May 1st – 3rd
* Harvey Report
  + TRE will be publishing a study/report on the impacts of Hurricane Harvey in December.
* 2019 Black Start and Restoration Training
  + Pilot: February 25th (Generation and Transmission Dynamics) and February 26th – 28th (Black Start and Restoration Training)
  + Week 1: March 18th (Generation and Transmission Dynamics) and March 19th – 21st (Black Start and Restoration Training)
  + Week 2: March 25th (Generation and Transmission Dynamics) and March 26th – 28th (Black Start and Restoration Training)
  + Week 3: April 1st (Generation and Transmission Dynamics) and April 2nd – 4th (Black Start and Restoration Training)
  + Week 4: April 8th (Generation and Transmission Dynamics) and April 9th – 11th (Black Start and Restoration Training)
  + Week 5: April 15th (Generation and Transmission Dynamics) and April 16th – 18th (Black Start and Restoration Training)
  + Week 6: April 22nd (Generation and Transmission Dynamics) and April 23rd – 25th (Black Start and Restoration Training)
  + Inclement Weather Week: April 29th (Generation and Transmission Dynamics) and April 30th – May 2nd (Black Start and Restoration Training)
* 2019 Operator Training Seminar
  + Pilot: August 13th – 15th
  + Week 1: October 15th – 17th
  + Week 2: October 22nd – 24th
  + Week 3: October 29th – 31st
  + Week 4: November 5th – 7th
  + Week 5: November 12th – 14th
  + Week 6: November 19th – 21st
* New Chair and Vice Chair
* New Training Building Construction has begun.
* ERCOT’s Manager, Operations Training; Mark Spinner would like to visit all Market Participant’s control room / training facilities and meet with the Control Room Management and Training Department to obtain input on how ERCOT can assist your training program.
* Black Start Seating Criteria
  + It was identified there should be some criteria for selecting who gets first chance at seats during Black Start training.
  + Software solution not available and manual methods are complex and time consuming.
  + New Training Building additional space may offer respite for a time.
  + Two solutions were suggested:
    - Early Registration limited to only operators, then open registration for everyone else. Have all required Market Participants update the required number of seats.
    - Draft NOGGR for ERCOT Nodal Operating Guide Section 1.5 Operational Training to clearly state who shall attend and correct other issues with the section.
* New Business
  + NERC PCGC survey on Operator Certification
* Adjourn
* Next Meeting Dates (Information will be updated by the meeting)

February None (Black Start Training)

March 8 (1 pm) TCC 1, Rm 252 / WebEx (after Black Start Week 6)

April 12 (1 pm) TCC 1, Rm 253 / WebEx (after OTS Week 3)

May 9 (1 pm) TCC 1, Rm 253 Trainer Development

May 10 (9 am) TCC 1, Rm 253 / WebEx

June 14 (9 am) TCC 1, Rm 252 / WebEx

July 12 (9 am) TCC 1, Rm 253 / WebEx

August 9 (9 am) TCC 1, Rm 253 / WebEx

September 12 (1 pm) TCC 1, Rm 253 Trainer Development

September 13 (9 am) TCC 1, Rm 253 / Web Ex

October 11 (9 am) TCC 1, Rm 253 / WebEx

November 8 (9 am) TCC 1, Rm 252 / WebEx

December 13 (9 am) TCC 1, Rm 253 / WebEx

[**WebEx Conference**](https://ercot.webex.com/ercot)

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