



**Generator Winter
Weatherization Workshop**
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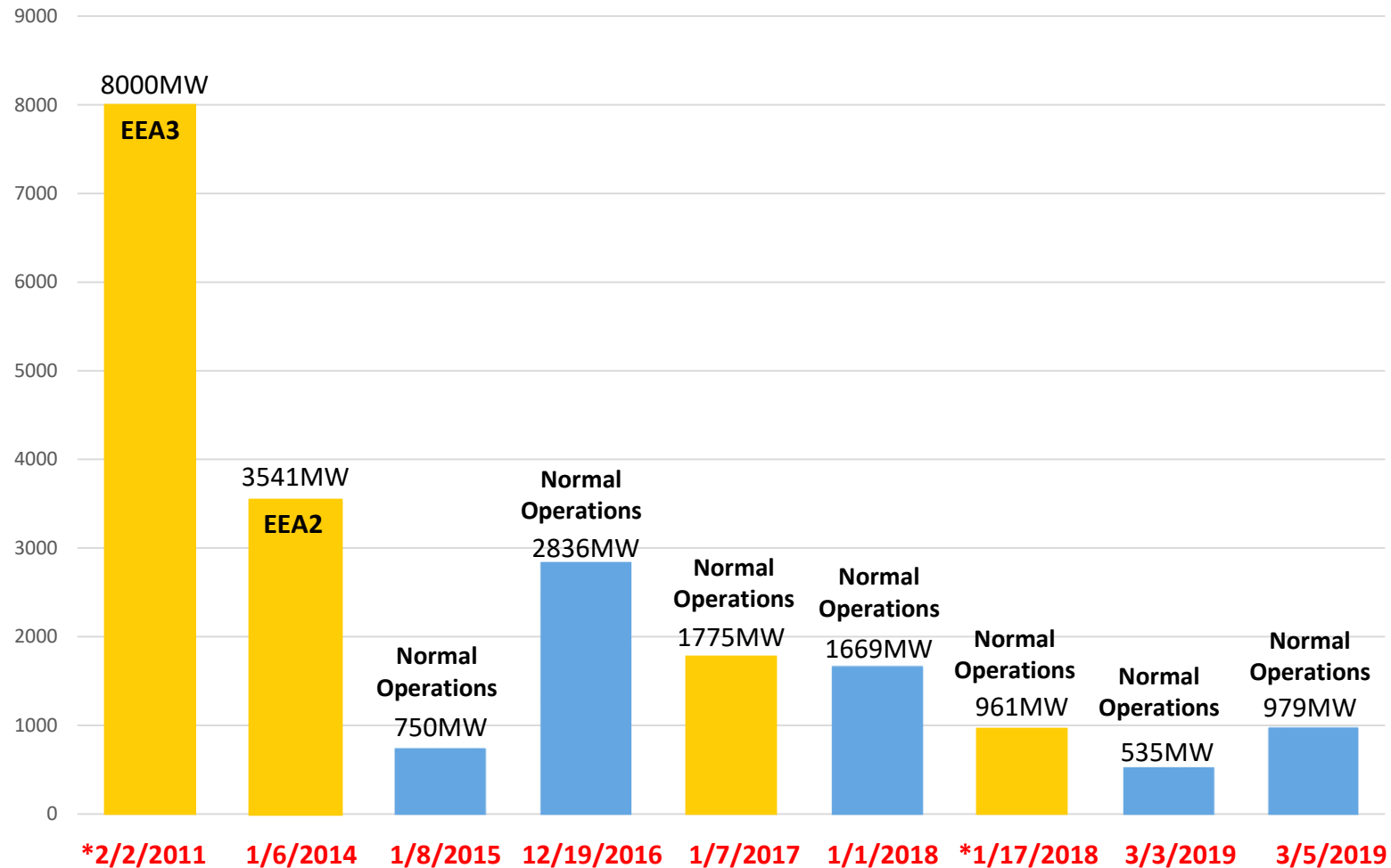
February 2011 Headlines....



PUCT Regulatory Requirements for Generator Preparedness

- §25.53. Electric Service Emergency Operations Plans.
 - (c)(1)(H) A plan for the inventory of pre-arranged supplies for emergencies.
 - (c)(1)(I) A plan that addresses staffing during severe weather events.
 - (c)(2)(A) A plan that addresses severely cold and severely hot weather.
 - (c)(2)(B) A plan that addresses any known critical failure points, including any effects of weather design limits.
 - (c)(2)(G) Checklists for generating facility personnel to address emergency events.
 - (c)(2)(H) A summary of alternate fuel and storage capacity.
 - (c)(2)(I) A plan for alternative fuel testing if the facility has the ability to utilize alternative fuels.
 - (c)(2)(d) A Market entity shall conduct or participate in one or more drills annually to test its emergency procedures if its emergency procedures have not been implemented in response to an actual event within the last 12 months.

Generation MW tripped due to frozen instrumentation



Salmon colored reflects four coldest days in ERCOT in last eight years

* 2/2/2011 and 1/17/2108 were the two coldest days this decade

Plant spot checks winter season 2018/2019 results

- 97 units spot checked
 - ✓ The purpose of spot checks is to verify plant personnel are following their weatherization plan.
 - ✓ As necessary, plant personnel are left with a recommendation(s) based on lessons learned or best practices observed.
 - ✓ Company senior management is emailed results.
- Fuel types
 - 4 coal units
 - 93 gas fired units (conventional and combined cycle)
 - 33 units agreed to improve preparations and/or records management and will be scheduled early in 2019 to verify improvements.
 - 64 units had no observed deficiencies in their plan or records management.

Common causes of transmitter manifolds and/or sensing lines freezing

- Tripped heat trace circuit breaker.
- Blown fuse in heat trace panel.
- Contractor error when terminating heat trace after testing.
- Insulating contractor damage to heat trace.
- Section of heat trace not functioning.
- Incorrect heat trace for application.
- Heat trace open ended and not grounded.
- Transmitter cabinet heater not functioning.
- Poor or lack of wind break measures.
- Transmitter(s) exposed to the elements.
- Gaps in insulation.

What have we learned since February 2011?

- ✓ Identify critical components if frozen, will derate, trip or fail to start the unit and incorporate the measures to prevent from freezing into weatherization plan.
- ✓ Heat trace failure rates in Texas on average are 10-15% from previous season.
- ✓ Detailed testing of heat trace is necessary, identifying critical circuits. Repair at minimum, critical circuits.
- ✓ Verify critical heat trace circuits are functioning prior to every extreme cold weather event.
- ✓ Insulation inspections, focusing on critical components.
- ✓ As an additional measure, install wind breaks and/or space heaters protecting critical components, focusing on the N and NE sides of unit. Avoid off the shelf tarps.

What have we learned since February 2011? (continued)

- ✓ Review scope of contractor work and verify acceptable completion.
- ✓ Verify instrument air dryers, dew point monitoring, blow downs are all operating correctly.
- ✓ Conduct a refresher training drill in the fall with operators on extreme cold weather procedures.
- ✓ Ensure critical transmitters are in a heated enclosure and inspect integrity of transmitter enclosures in the fall as part of weatherization plans.
- ✓ Test critical components transmitter cabinet thermostat and heater as part of heat trace testing.
- ✓ Weatherization plan portion of EOP should be updated annually as lessons are learned and sent to ERCOT at EOP@ercot.com.

Closing comments.....

- ✓ ERCOT assists generators in preparing for winter operations with spot checks, sharing lessons learned, best practices, recommendations and the annual fall workshop.
- ✓ Recent history has shown us that for every extreme cold weather event, a small amount of generation will experience freeze related derates or trips.
- ✓ Overall, ERCOT was pleased with the performance of generators during this past winter.
- ✓ For winter 2019/2020, spot checks will begin November 15, 2019 and will conclude February 28, 2020.

Thank you generator owners, operators and plant staff for your efforts on winter weatherization!

