TEXAS RE
Ensuring electric reliability for Texans

NERC and Texas RE Update

Mark Henry
Reliability Services, Texas Reliability Entity

ERCOT/Texas RE Generator Winter Weatherization Workshop

September 5, 2019

Agenda

Beginning Time	End Time	Description	Presenter
08:00	08:15	Regulatory review of winterization activities.	Mark Henry Director, Reliability Services Texas Reliability Entity, Inc. Mark.Henry@TEXASRE.org
08:15	08:45	Causes of frozen instrumentation from the last two winters and actions to prevent reoccurrence.	Patrick Jackson Plant Engineer Tenaska Kiamichi Generating Station PJackson@TENASKA.com
08:45	09:15	Improvements to Deer Park Energy Center winter readiness and lessons learned from GT1 trip.	Jacob Frahm Plant Engineer, Deer Park Energy Center Jacob.Frahm@Calpine.com
09:15	09:25	Break	
09:25	09:55	Improvements and lessons learned to Lamar Power Partners winter readiness.	Steven Harper Lamar Power Partners Steven.Harper@Luminant.com
09:55	10:25	Correct testing of heat trace.	Patrick Bartell, Valin Corporation PBartell@valin.com
10:25	10:35	Break	
10:35	11:05	Understanding critical components within a series heat trace circuit.	Jeff Klier, Plant Manager Wolf Hollow Generating Station Jeffery.Klier@constellation.com
11:05	11:20	ERCOT update	Alan H. Allgower Operations Analyst, Senior, ERCOT alan.allgower@ercot.com
11:20	12:00	Preliminary winter 2019/2020 outlook.	Chris Coleman, Meteorologist Sr, Load Forecasting & Analysis, ERCOT Chris.Coleman@ercot.com
12:00	12:05	Closing comments	Alan Allgower, ERCOT

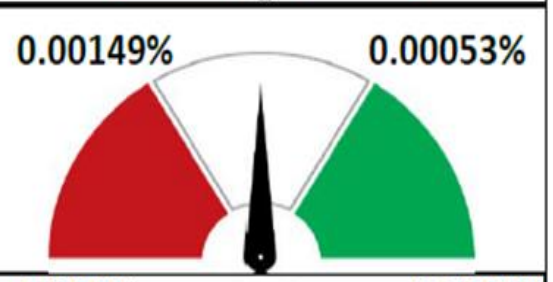
NERC Industry Metric on Events Caused by Gas-Fired Unit FO's due to Cold Weather or Gas Unavailability

Why is it important?:

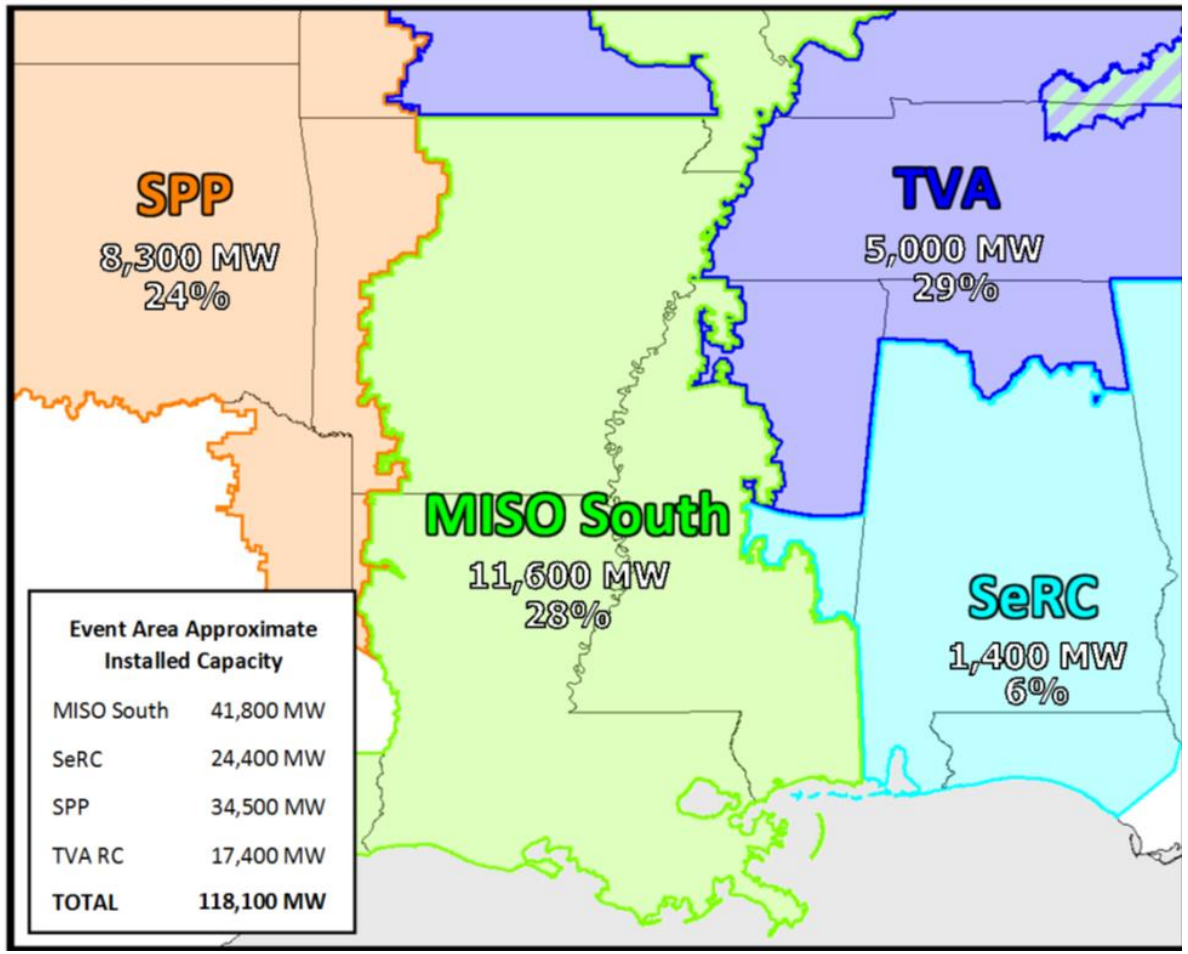
- Reduce risk to BPS reliability due to gas-fired unit outages during cold weather or gas unavailability

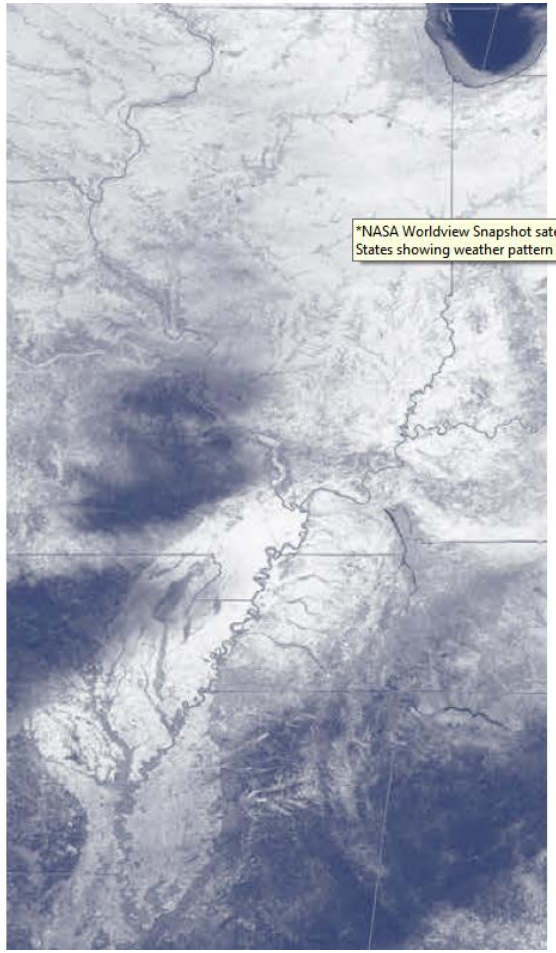
How is it measured?:

- Firm load loss due to cold weather or gas unavailability
- MWh of potential production lost initiated by cold weather and gas unavailability

	2019 Status
Data (Annual Measurement) ▪ No firm load loss due to gas-fired unit outages during cold weather: *Zero is green, else is red* (Cold weather months: January – March and December of the same calendar year) ***As of 4/1/2019, Metric status is Green.***	
Data (Annual Measurement) (Match with 4.4, year defined as Q3-Q2) ▪ No firm load loss due to gas unavailability: *Zero is green, else is red* ***As of 4/1/2019, Metric status is Green.***	
Data (Compared to a 5-year rolling average) ▪ Percentage of winter period net MWh of potential production lost due to gas-fired unit outages during cold weather (Cold weather months: January – March and December of the same calendar year) ▪ **Five-year average: 0.0068%**	
Data (Compared to a 5-year rolling average) ▪ Percentage of annual net MWh of potential production lost due gas unavailability compared to a 5-year rolling average (Due to data availability, year defined as Q3-Q2) ▪ **Five-year average: 0.1312%**	

Joint NERC/FERC Inquiry and Report



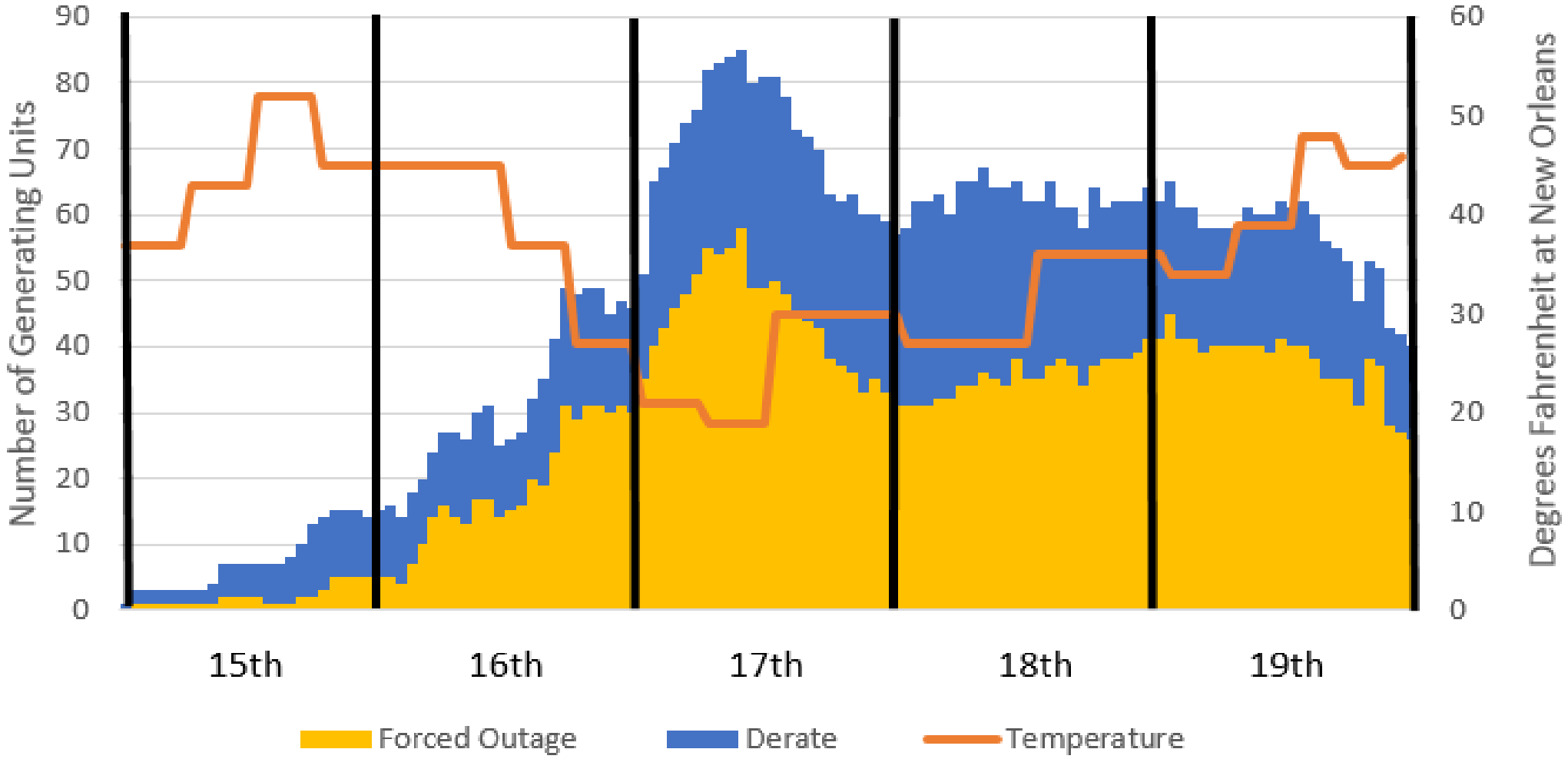


*NASA Worldview Snapshot satellite image of The United States showing weather pattern for January 18, 2018.

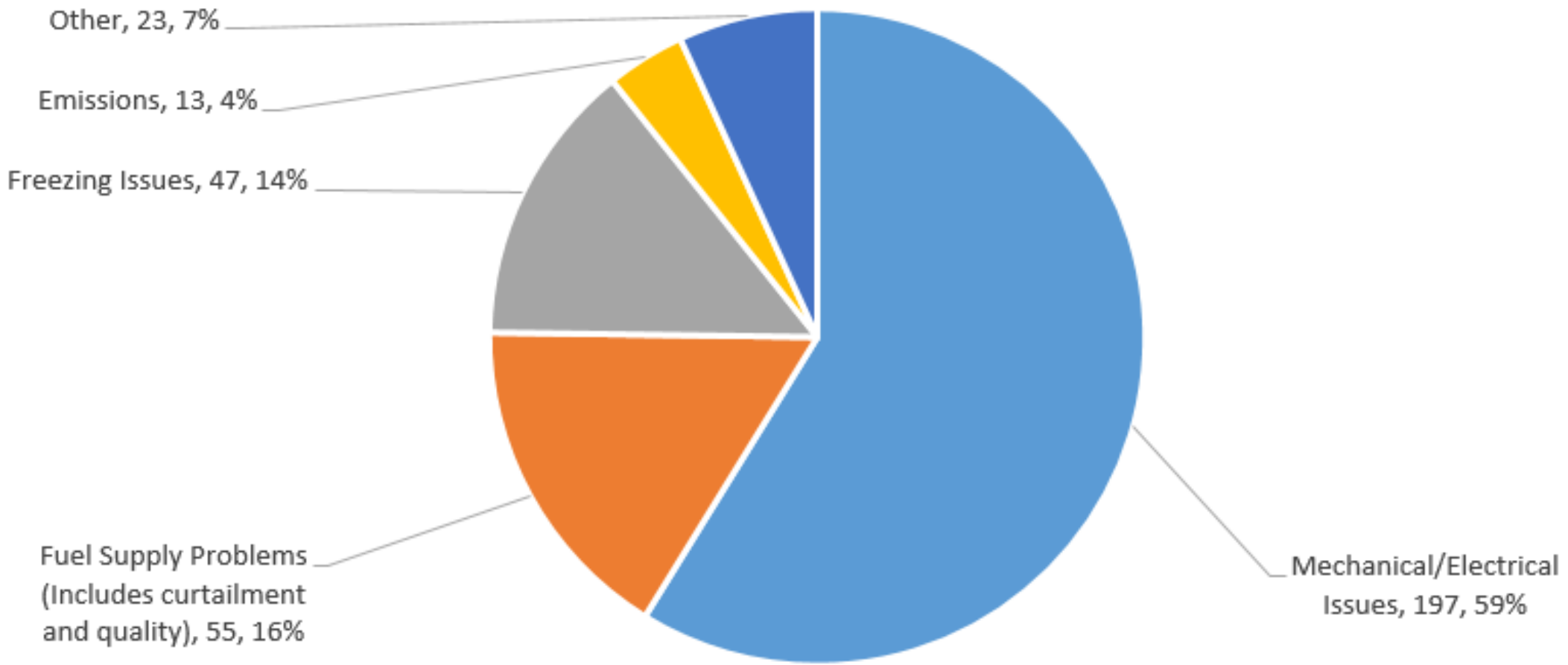
2019 FERC and NERC Staff Report

The South Central United States Cold Weather Bulk Electric System Event of January 17, 2018

January 15-19, 2018 – Number of Generation Unit Outages and Derates Versus Temperature, by Hour, for Event Area



January 15-19, 2018 - Causes of Unplanned Generation Outages and Derates for Southeast US Event Area



Findings and Recommendations from the Report

Generator Cold Weather Reliability:

Finding: The South Central U.S. Cold Weather BES Event of January 17, 2018 was caused by failure to properly prepare or "winterize" the generation facilities for cold temperatures.

Finding: Gas supply issues contributed to the Event, and natural gas-fired units represented at least 70% of the unplanned generation outages and derates.

Recommendation 1 from the Report

The Team recommends a three-pronged approach to ensure Generator Owners/Generator Operators, Reliability Coordinators and Balancing Authorities prepare for cold weather conditions:

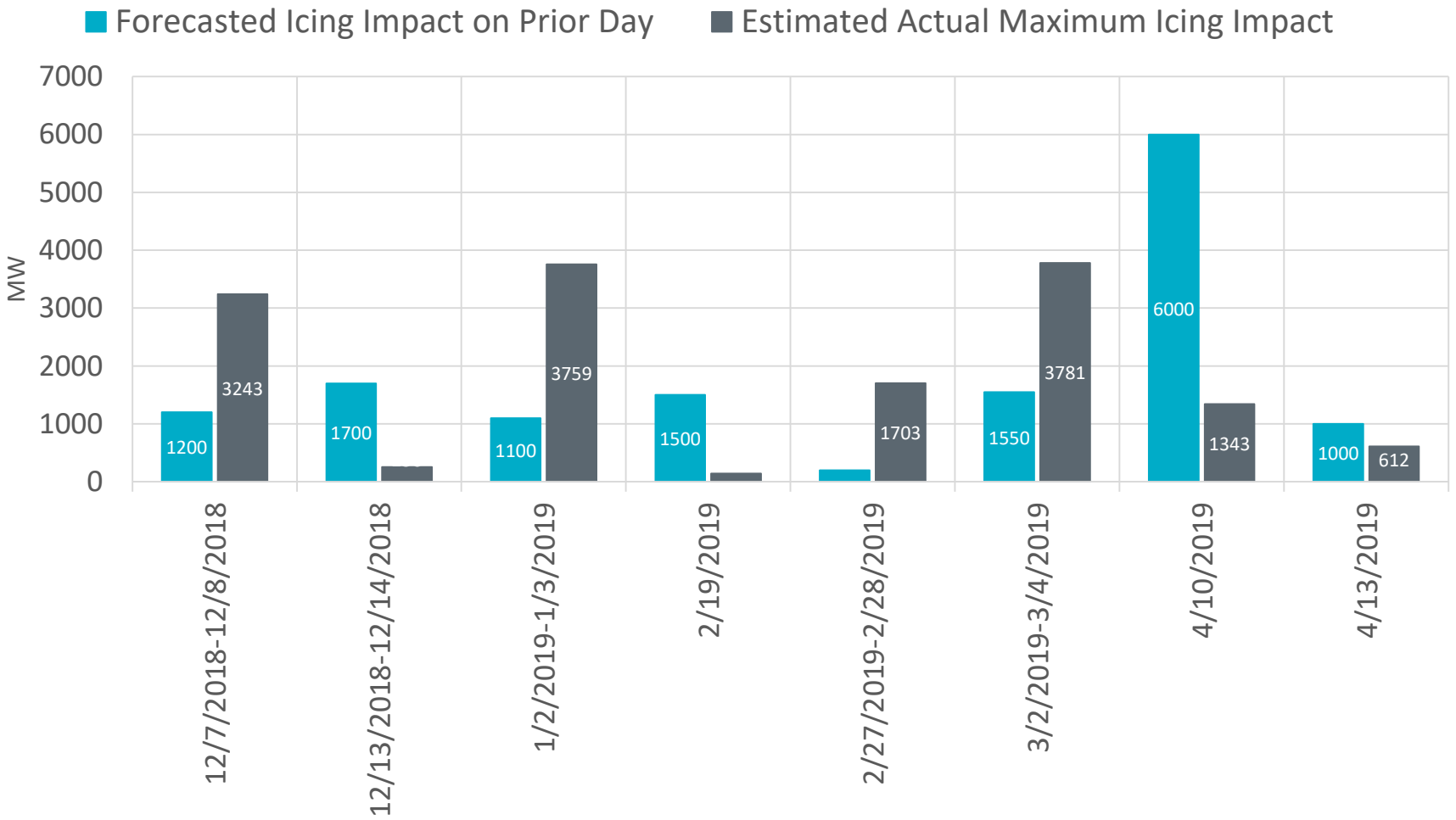
1) **development or enhancement of one or more NERC Reliability Standards,**

2) **enhanced outreach to Generator Owners/Generator Operators, and**

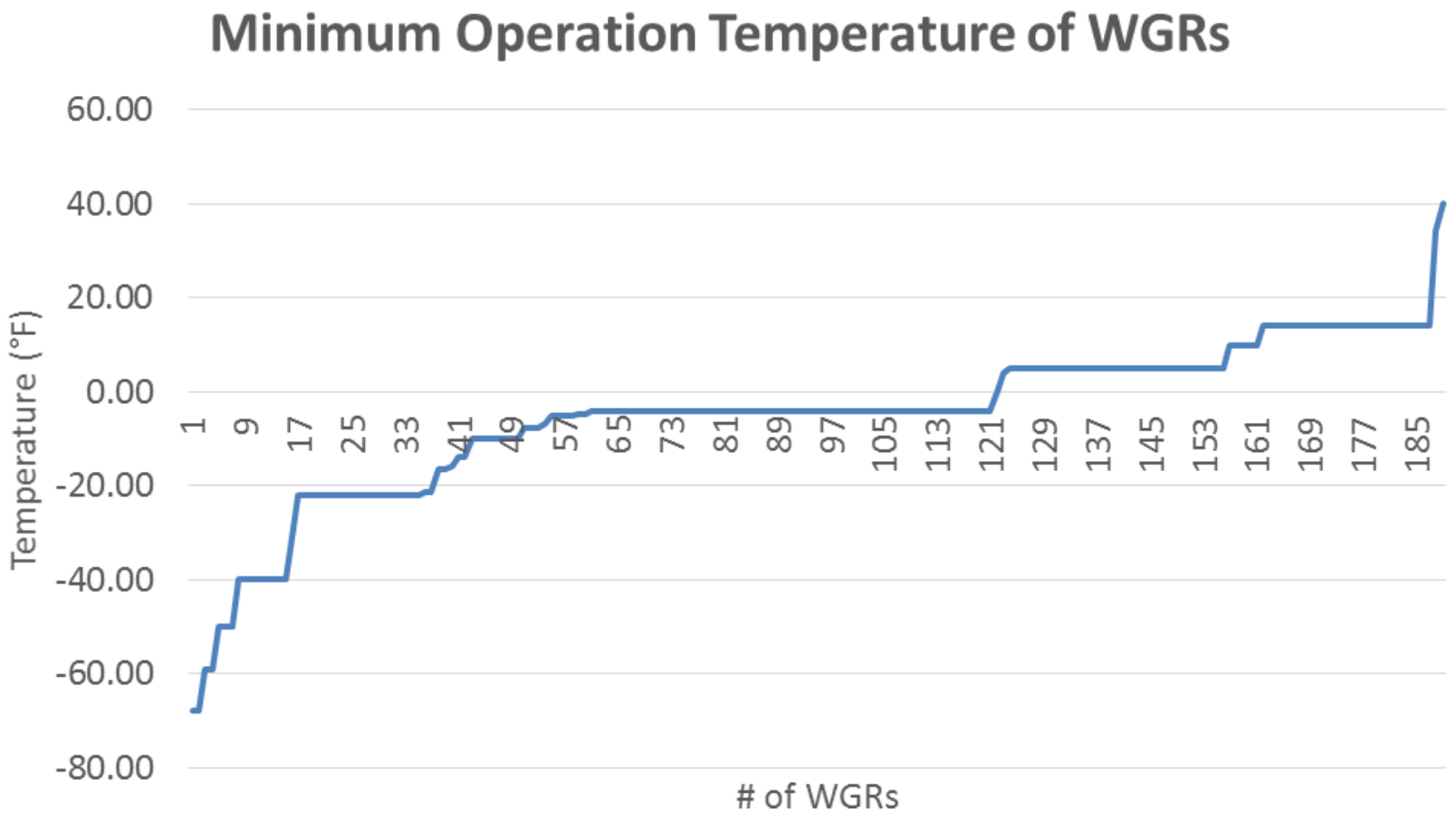
3) **market (Independent System Operators/Regional Transmission Organizations) rules where appropriate.**

ERCOT Wind Generation Icing Events in Winter 2018 - 2019

There were 8 distinct cold weather related icing events wherein the estimated icing related wind generation impact varied from 140 MW to 3700 MW. In all cases Icing Impact was forecasted in days prior



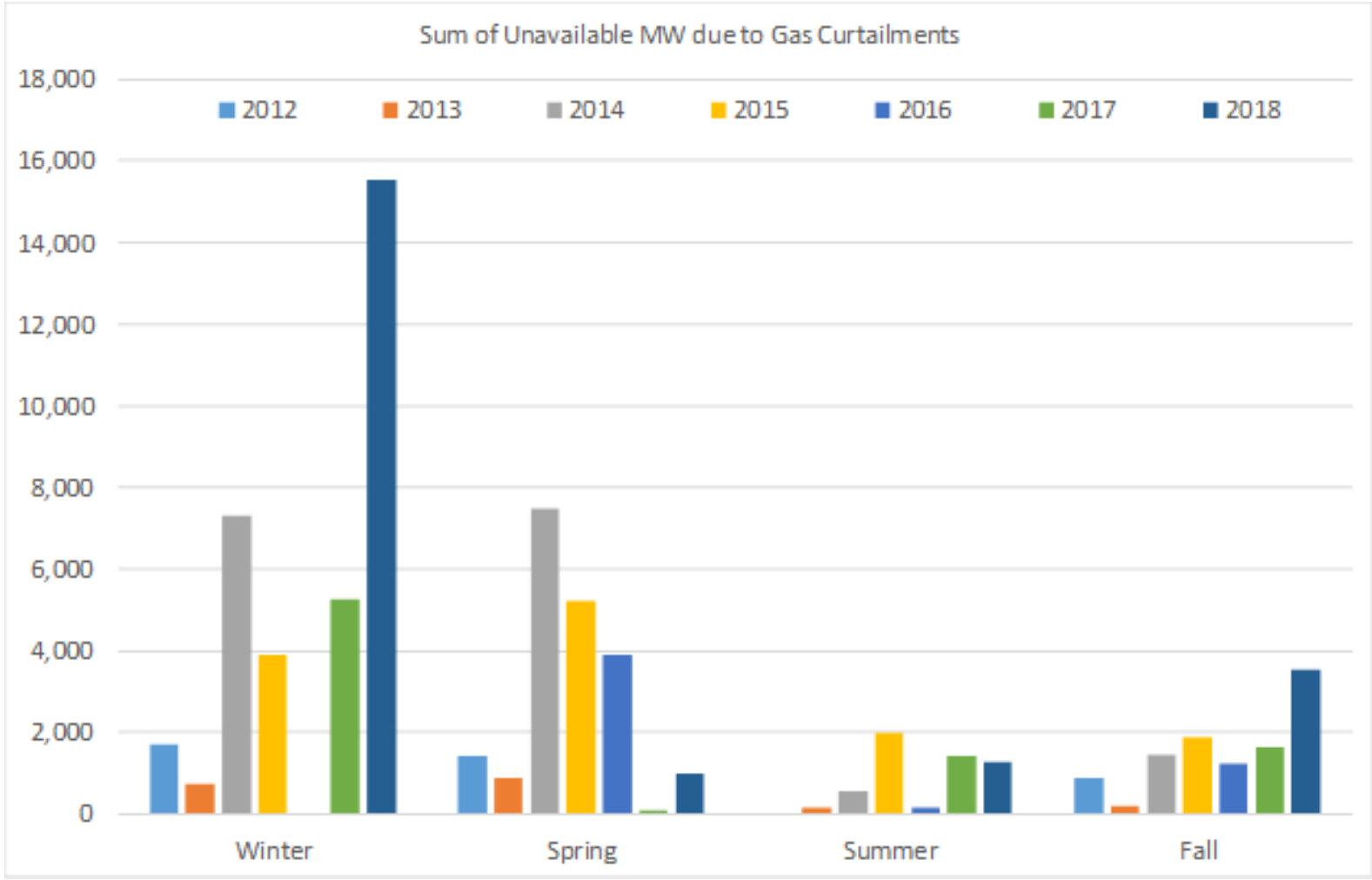
ERCOT Operation Limits of WGRs (as of early 2018)



Source: N. Mago, ERCOT

ERCOT Natural Gas Curtailments from GADS

- **Significant increase in gas curtailments in 2018**
- **Continuing to monitor as resource mix changes to more gas generation**



Questions?


For further information:
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Appendix: Generation Sound Practices from the NERC/FERC Report

1) Southern Company (in the SeRC footprint), performed numerous generator fuel switches, using alternative fuel sources to help prevent a fuel supply emergency. Fuel-switching is especially important during cold weather. During extreme cold weather events, natural gas limitations can be predicted/expected to occur as residential and commercial gas heating needs compete with electric generation needs, and gas pipeline entities can be expected to limit pipeline use to sustain gas pressure throughout the cold weather demand.

2) **Continuous monitoring of heat tracing systems** complete with a display panel and indicator lights.

3) **Inspection of heat tracing circuits**, including power supplies, prior to winter.

4) Having regular, **periodic operational checks of heat tracing** circuits.

5) **Annual update of winter preparation checklist**, incorporating lessons learned from previous winter.

6) **Completion of freeze protection-related maintenance prior** to winter weather.

7) **Increased operator rounds/increased staffing** prior to, and during winter weather to check for proper operation of plant equipment susceptible to freezing conditions.

8) Addition of a “freeze protection operator,” during adverse weather who is responsible for inspecting critical equipment, and ensuring appropriate protection is in place.

Appendix: Generation Sound Practices from the NERC/FERC Report

9) Firing of dual fuel units that have not fired on their secondary fuel source during the previous year, prior to a forecast cold weather event.

10) RTO or RC conducting a survey of GO/GOP to determine winter preparedness activities have been completed, and fuel switching testing has been performed.

11) Sharing lessons learned by GO/GOP from extreme events, including through the NERC Events Analysis lessons learned program, or through Regional processes.

12) Developing procedures and training for Generator Operators on when to call for fuel switchable resources.

13) Maintaining **inventory of pre-arranged supplies** and equipment for extreme weather events by Generator Owners and Operators.

14) Generator Owners and Operators conducting **readiness drills** on extreme weather preparation.

15) Generators connecting to multiple pipelines when possible to allow for obtaining gas supply during tight market conditions if one or more pipelines has operational issues or high utilization that forces cuts to interruptible supply.

16) Generators keeping close contact with natural gas pipeline companies during events to keep abreast of timely public postings of operational details such as operationally available capacity and unexpected outages, which allows generators to make more flexible and timely decisions.

Appendix: NERC Generator Winter Weather "Lessons Learned"

- LL20110902 Adequate Maintenance and Inspection of Generation Freeze Protection
- LL20110903 Gen. Unit Temperature Design Parameters & Extreme Winter Conditions
- LL20111001 Plant Instrument &Sensing Eqpt Freezing Due to Heat Trace & Insulation Failures
- LL20111002 Plant Fuel Switching and Cold Weather
- LL20120101 Plant Onsite Material and Personnel Needed for a Winter Weather Event
- LL20120102 Plant Operator Training to Prepare for a Winter Event
- LL20120103 Transmission Facilities and Winter Operations
- LL20120901 Wind Farm Winter Storm Issues
- LL20120902 Transformer Oil Level Issues During Cold Weather
- LL20120903 Winter Storm Inlet Air Duct Icing
- LL20120904 Capacity Awareness During an Energy Emergency Event
- LL20120905 Gas and Electricity Interdependency
- LL20140503 Improved Contractor Oversight Needed
- LL20180702 Preparing Circuit Breakers for Operation in Cold Weather

https://www.nerc.com/pa/rrm/ea/Pages/Lessons-Learned.aspx

https://www.nerc.com/pa/rrm/ea/Pages/February-2011-Southwest-Cold-Weather-Event.aspx