



2021-2022 Generator Winterization Survey

Survey Results

Reliability Subcommittee

October 28, 2021

Purpose & Key Takeaways



Purpose:

Review survey results

Key Takeaways:

- Greatly improved participation
- Generation prepared for winter
- Improvement in preparedness from last year

Executive Summary

- MISO appreciates stakeholder participation in the 3rd Generation Winterization Survey
- MISO generation generally prepared for winter operations
- Significant increase in responses rate

Response rate as % of MW	Generator Winterization	Gas Fuel Specific Questions ¹
2021	90%	91%
2020	71%	83%
2021	60%	72%

¹Prior to 2021 this was a separate survey



MISO GENERATORS

COMPLETE THE ANNUAL
GENERATOR WINTERIZATION SURVEY

Survey closes September 28
PLEASE LOG INTO YOUR PROFILE AND CLICK HERE.

The banner features a dark blue background with a white snowflake icon in a circle. The top left shows an industrial facility, and the top right shows snow-covered power lines. The text is white and blue.

Survey Changes from 2020

Thanks to Kari Hassler (Xcel), Jennifer Bean (Entergy) and Brad Arnold (Ameren) for helping with testing and providing feedback on the survey redesign.

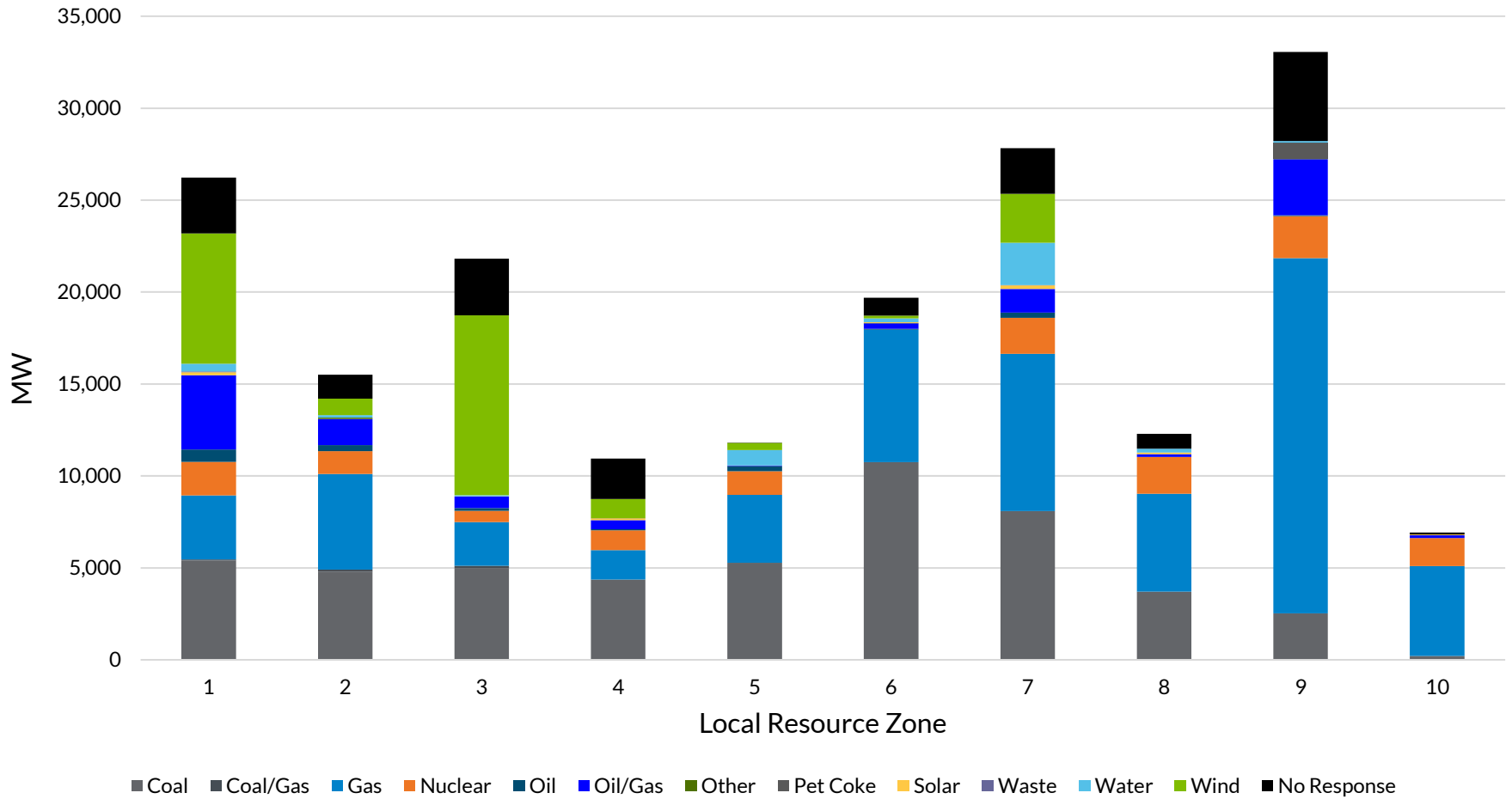
- Single combined generator and gas survey
- No need to submit if data unchanged from 2020
- Can complete survey for all units at a single station and submit for entire station vs. each unit separately
- EMS, CPNode and CommonName name displayed for each unit/generator
- Temperature question
 - Wording based on new NERC EOP-011-2 R7 standard, control room operator and stakeholder input
 - Pick units as Fahrenheit or Celsius
 - Fixed numeric value, no longer free format
- Spreadsheet option
 - Recommended for responders with more than 20 generators
 - Created a macro-less spreadsheet to limit IT security issues
- Eliminated over 50% of questions to focus on quantitative and forward-looking questions

Generator Winterization

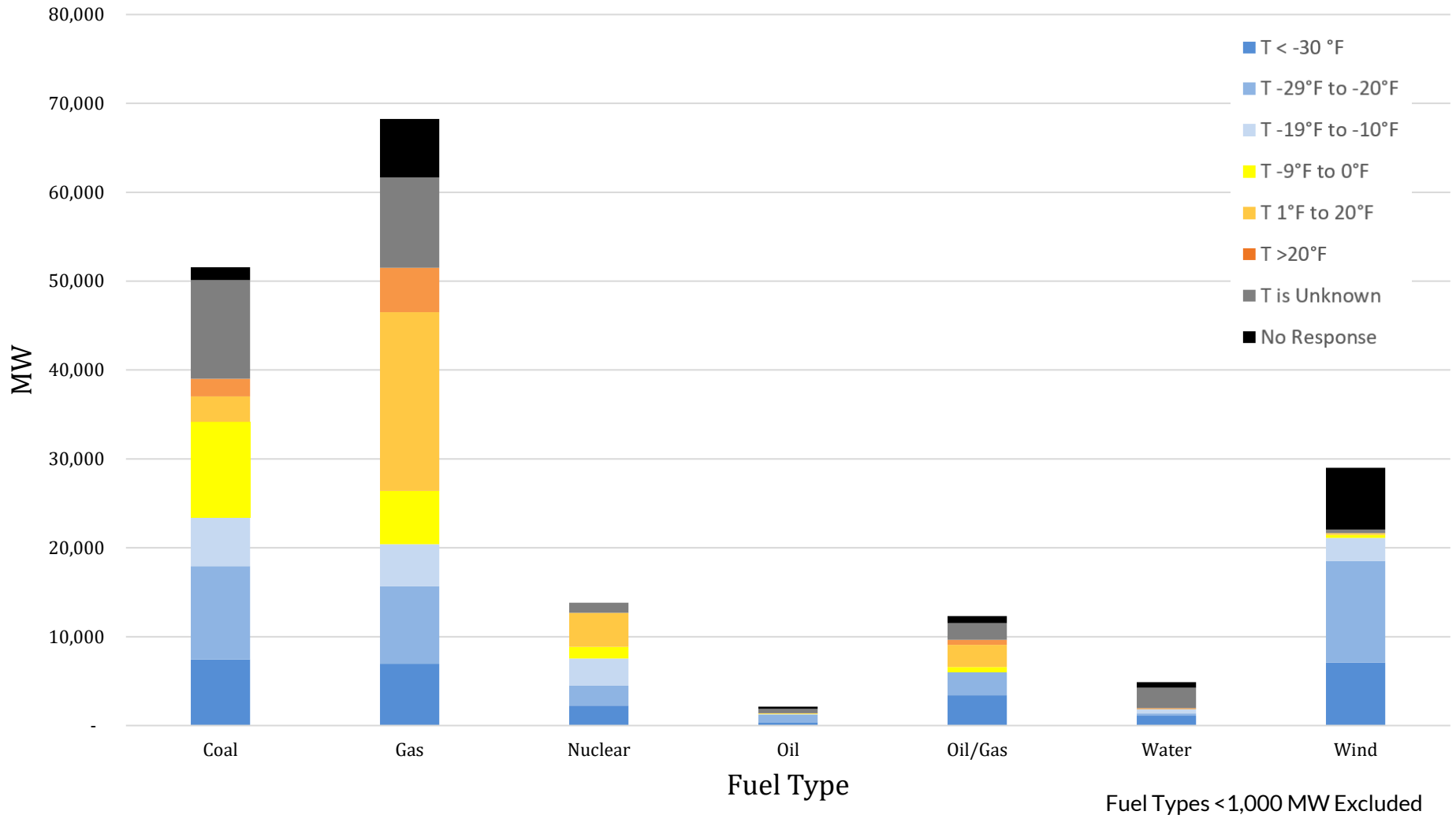
Notable Results for units responding to survey

- 97% have a plan to prepare for winter
- 88% have reviewed NERC's Guidelines for Unit Winter Weather Readiness
- 83% have a severe cold weather checklist
- Responses from 2020 showed improvement in preparedness

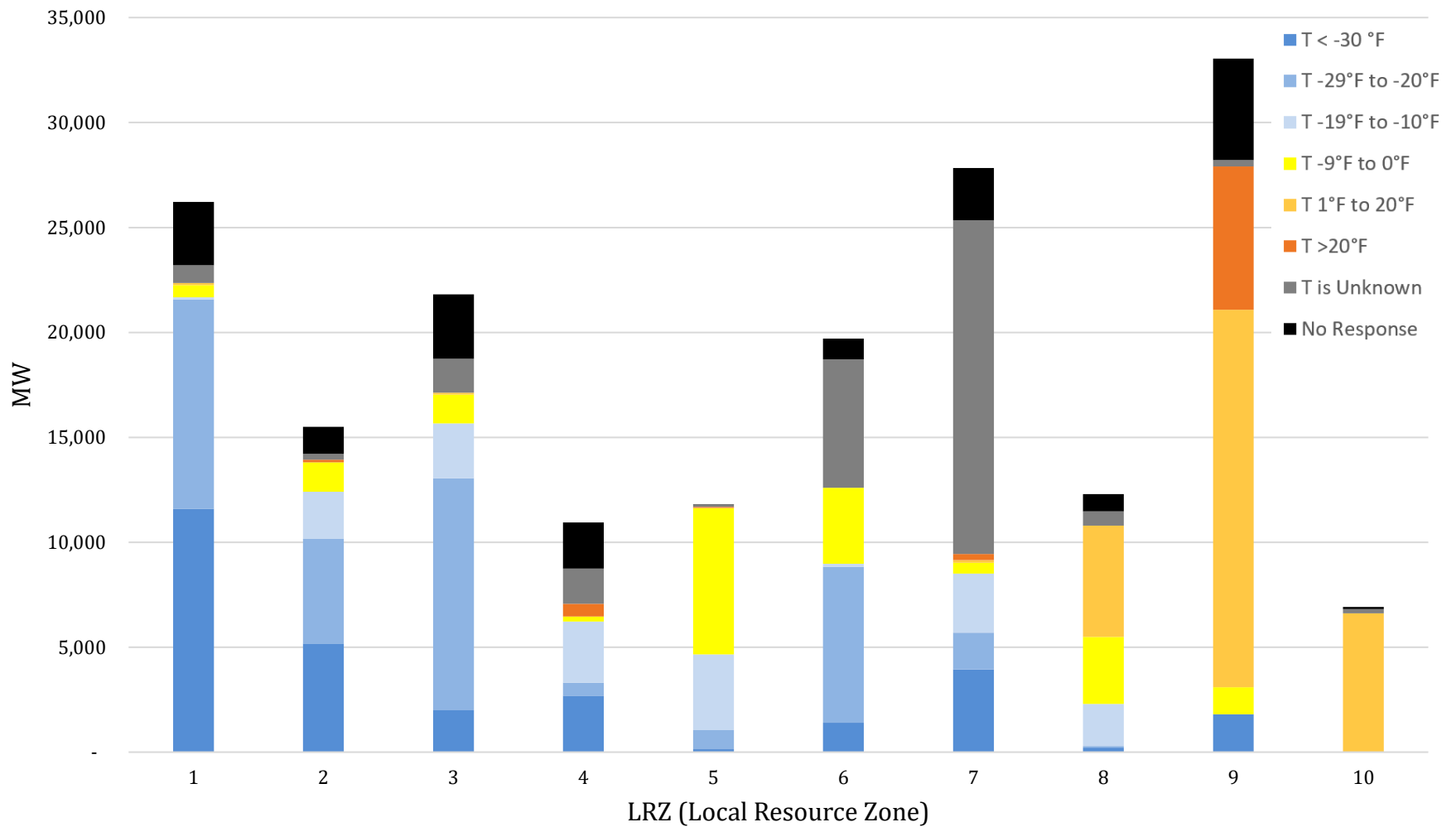
Survey Responses by LRZ and Fuel Type



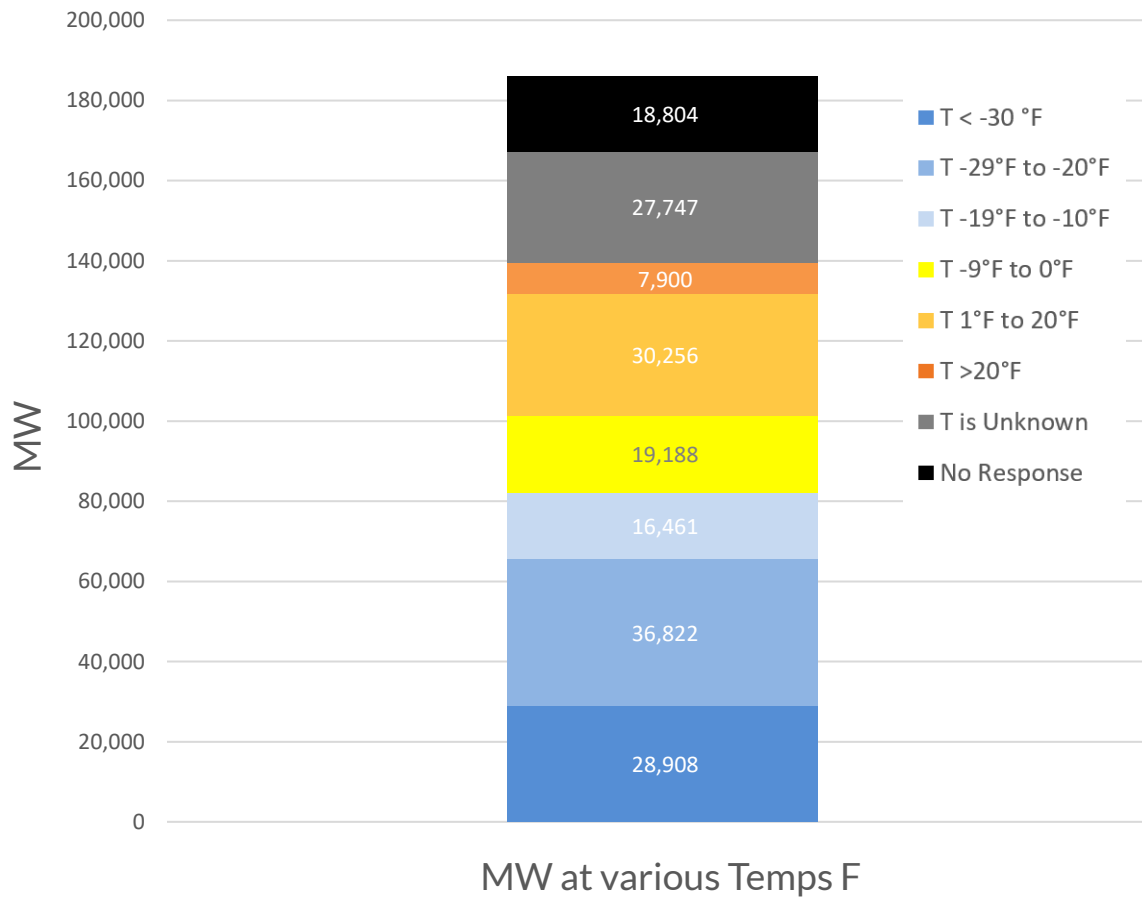
Temperature Rating by Fuel Type



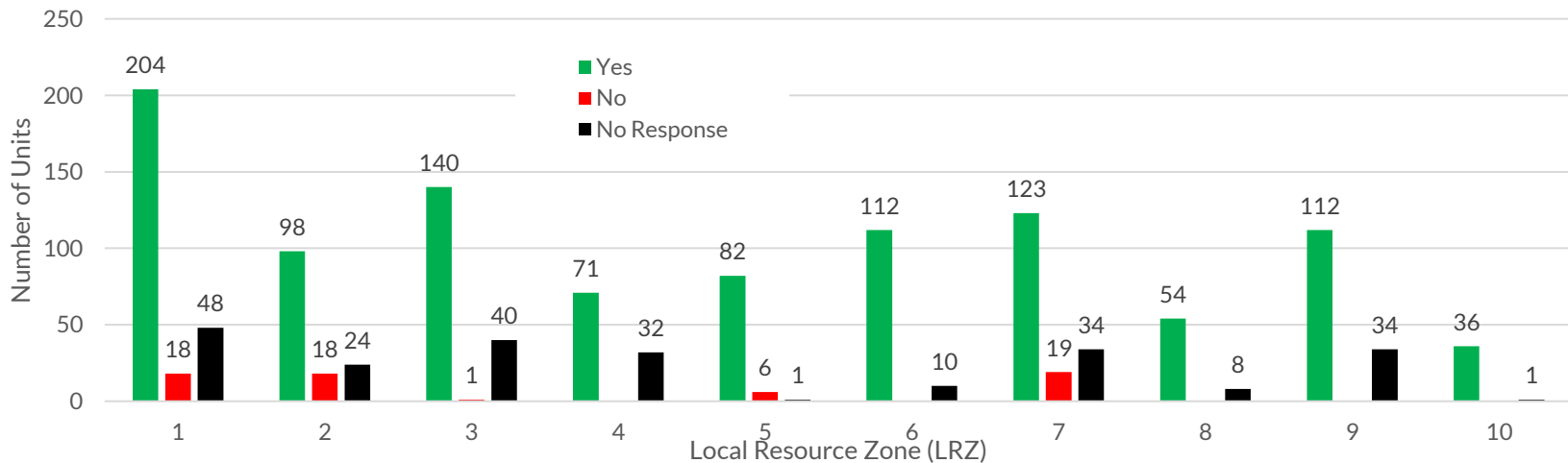
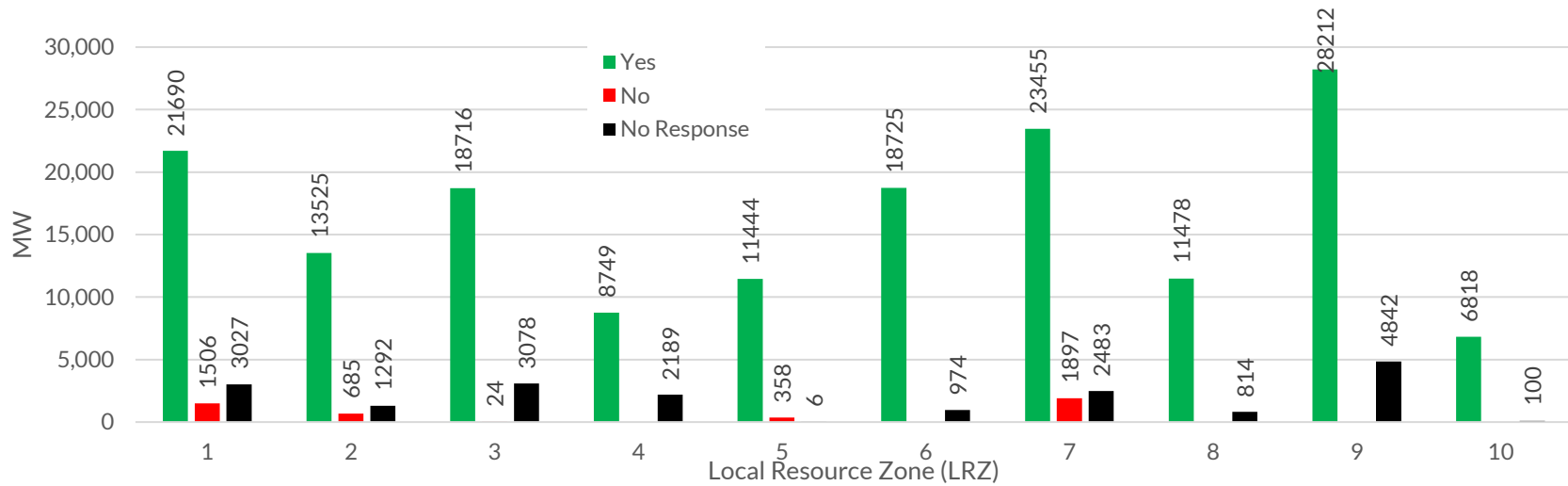
Temperature Rating by LRZ



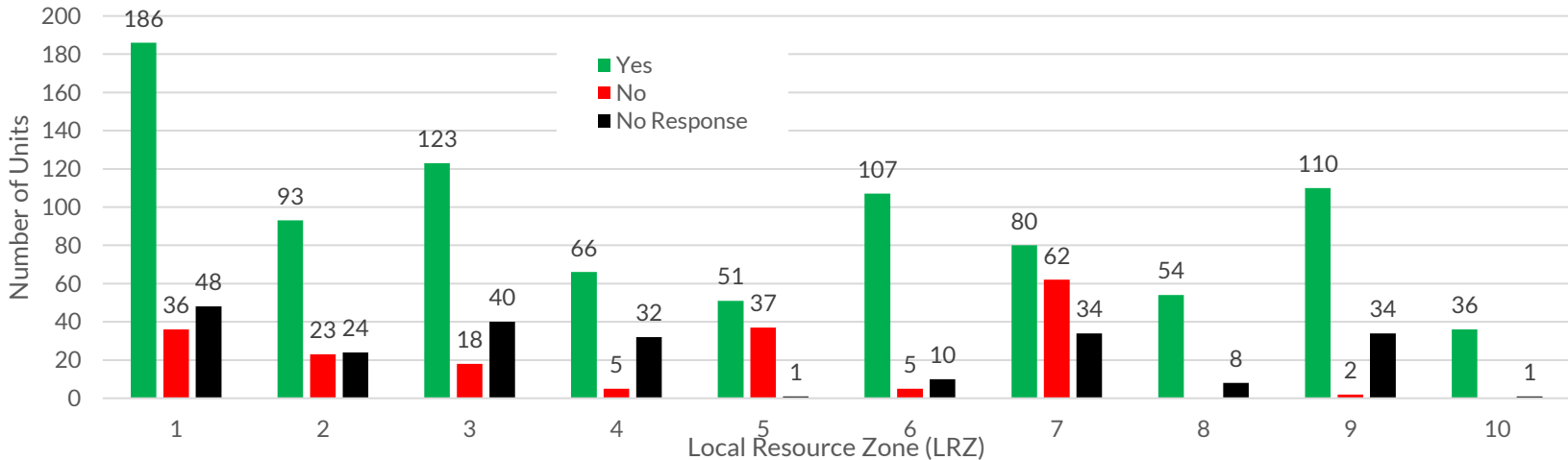
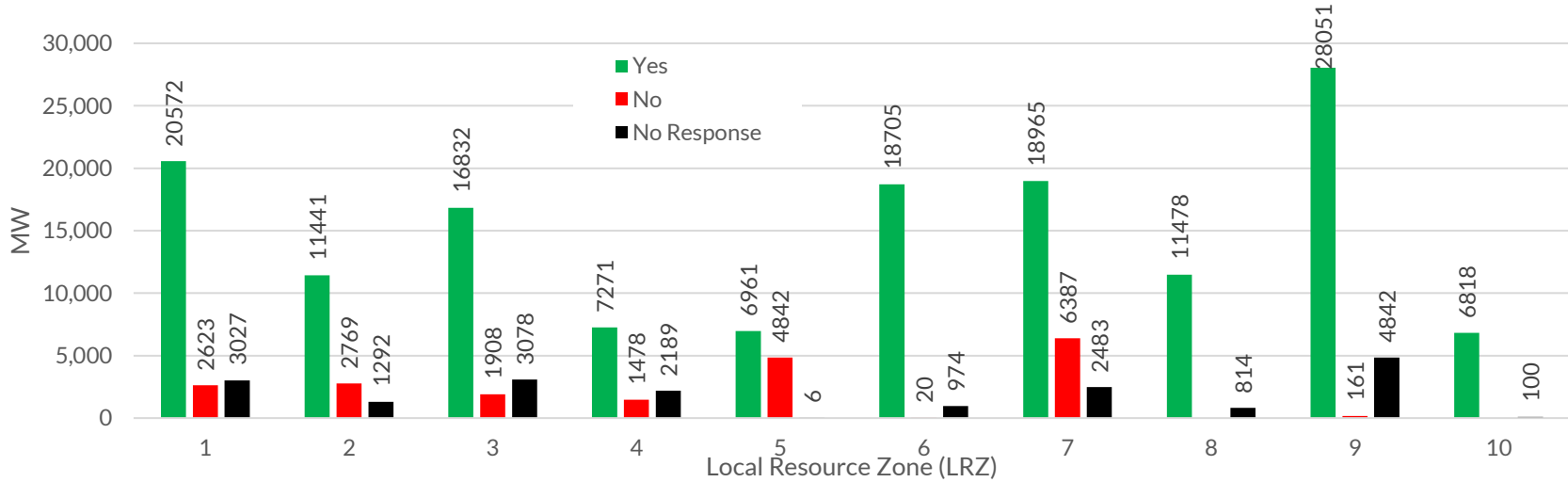
Temperature Rating by Capacity



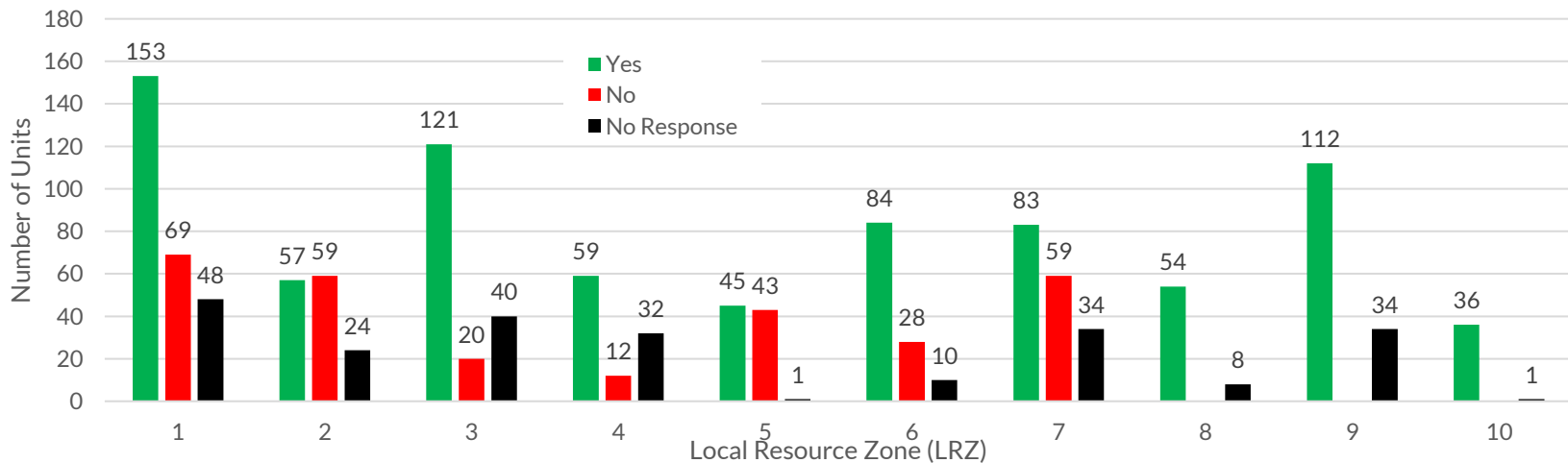
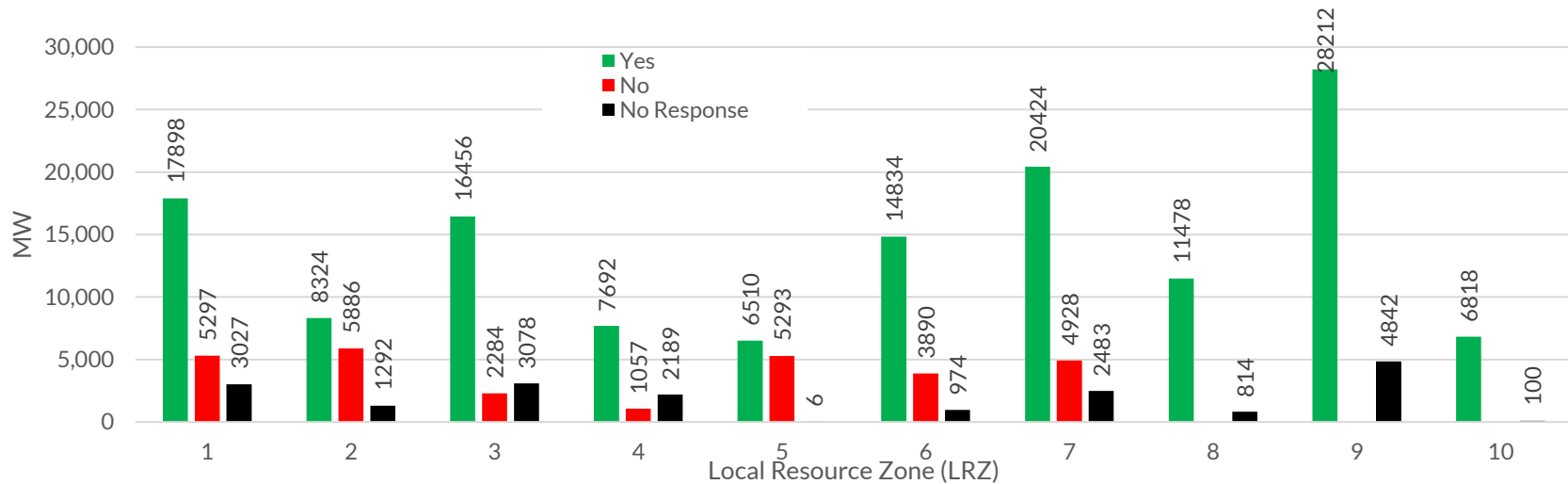
Has a Plan to Prepare for Winter



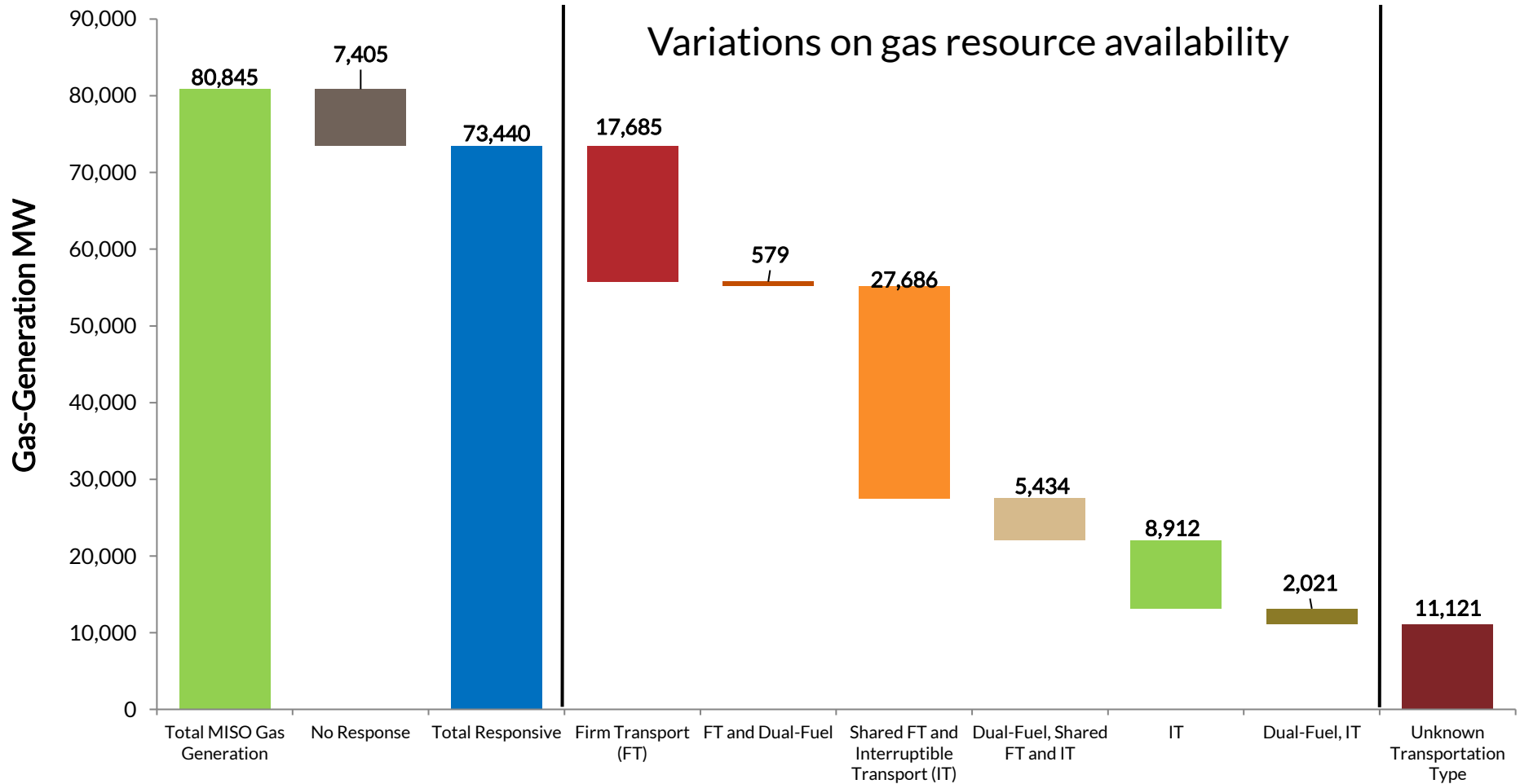
Has Reviewed NERC Guidelines



Has Procedure for Extreme Cold Weather Event



2021 Gas Fuel Survey Results



Survey Data Use in Real-Time Ops

- Real-time operations uses gas generation specific data
 - Associate generators with specific gas pipelines
 - Monitor gas pipelines critical notices
 - Assess impact of OFO (Operational Flow Order) based on transport firmness
- Real-time operations uses temperature data to improve situational awareness
 - Assess expected performance of generators
 - Reach out to specific generators of concern

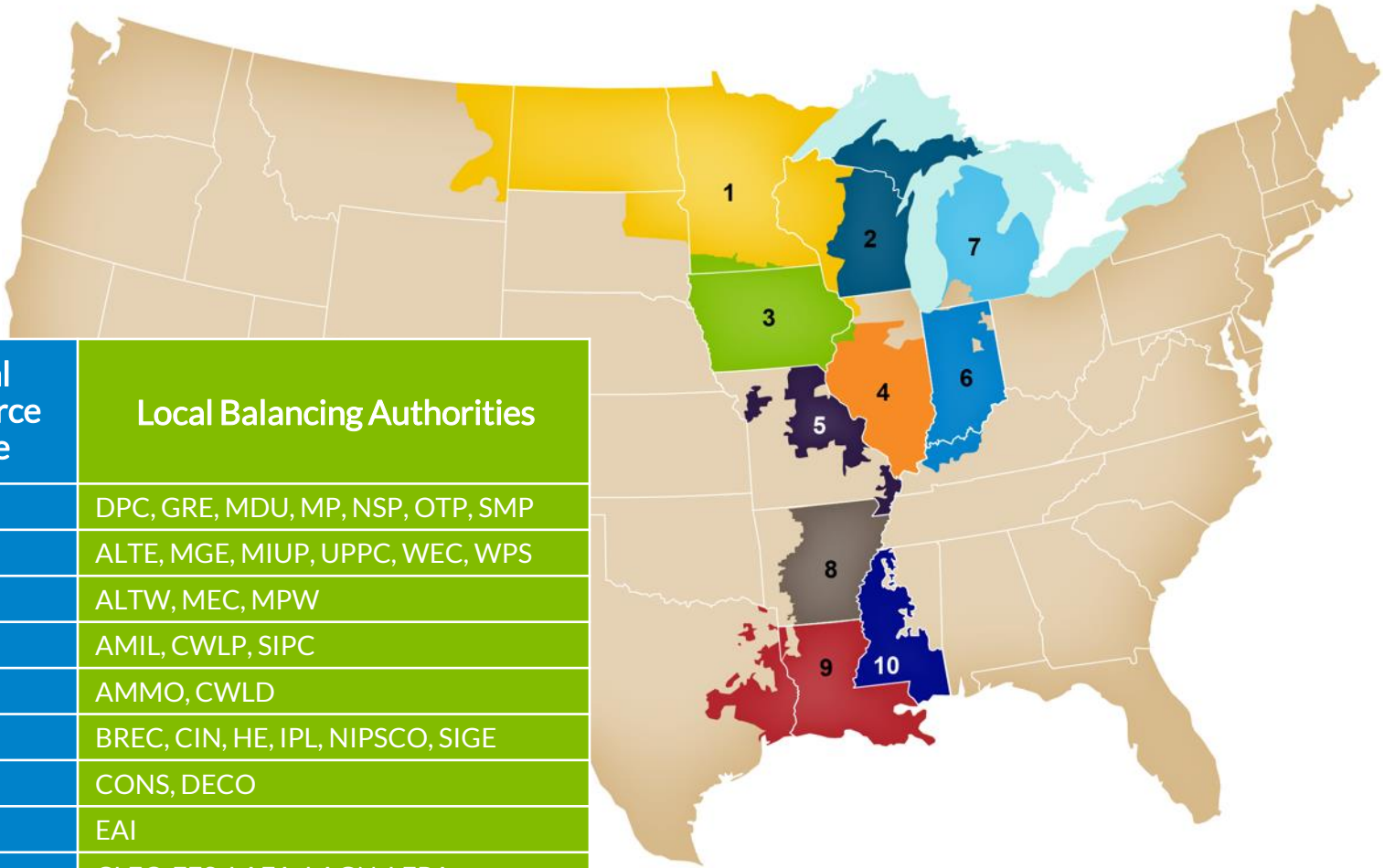
Contact Information

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Appendix

MISO LRZ Map



Local Resource Zone	Local Balancing Authorities
1	DPC, GRE, MDU, MP, NSP, OTP, SMP
2	ALTE, MGE, MIUP, UPPC, WEC, WPS
3	ALTW, MEC, MPW
4	AMIL, CWLP, SIPC
5	AMMO, CWLD
6	BREC, CIN, HE, IPL, NIPSCO, SIGE
7	CONS, DECO
8	EAI
9	CLEC, EES, LAFA, LAGN, LEPA
10	EMBA, SME

Survey Questions

Does the resource have a plan to prepare for winter or have all known actions to prepare already been taken?

* Yes No

What ambient air temperature can the plant reliability operate at for an extended period of time, i.e. >24 hours. Please provide your best estimate based on design temperature, historical operating temperature or current cold weather performance temperature determined by an engineering analysis.

Temperature limit is known

*Temperature

*Units

Temperature limit is unknown

There is no temperature that impacts operation

Has plant management and/or maintenance personnel reviewed the current NERC Guideline Generator Unit Winter Weather Readiness – Current Industry Practices?

* Yes No

Is there a corporate or plant procedure for an extreme cold weather event or have all known actions to prepare already been taken?

* Yes No