

Final Report on the Resiliency of South Carolina's Electric and Natural Gas Infrastructure

Against Extreme Winter Storm Events

5 million residents rely on **reliable energy**

South Carolina Governor Henry McMaster requested a comprehensive review of South Carolina's public and private power grid after the February 2021 winter storm that left large parts of Texas without power and running water.

9,900 miles of transmission lines

61,000 miles of distribution lines

72,000 miles of power lines operated by electric cooperatives

13,000 miles of natural gas transmission and distribution mains

9,000 miles of natural gas pipeline operated by natural gas municipal systems

Evaluation Criteria

The Report focuses on threats and conditions similar to those faced by the Texas power grid. The Report did not evaluate the impacts of other threats such as hurricanes, cyber threats, extreme heat, flooding, or other threats attributed to climate change.

Information Request

In March 2021, the Public Service Commission of South Carolina (PSC) directed all regulated, investor-owned electric and natural gas utilities to provide information. The PSC also encouraged Santee Cooper, the electric cooperatives, and other non-regulated electric and gas utilities in South Carolina to participate in the assessment. Approximately 65 Utility Providers participated in the review.

Conclusions

- 1** The Report indicates that, given the information provided, South Carolina's energy system and utility providers are adequately prepared to prevent and respond to outages caused by ice storms and other winter weather events.
- 2** The Report also recommends that a number of actions be considered to enhance the utilities' ability to respond to extreme winter weather events and to meet peak customer demand.
- 3** South Carolina has diversified generation sources to meet high winter demands. More than half of the electricity produced in Texas is fueled by natural gas. In contrast, about 30 percent of electricity production in South Carolina is fueled by natural gas.

Timeline

- March 12, 2021*
ORS Provides Notice of this Proceeding to South Carolina Regulated and Non-regulated Electric and Natural Gas Utilities
- March 12, 2021*
ORS Posts Notice of this Proceeding on its Website
- June 3, 2021*
ORS Hosts Webinar
- June 11, 2021*
Interested Parties Submit Initial Comments
- June 25, 2021*
Interested Parties Submit Responsive Comments
- September 30, 2021*
Draft Report Released by ORS
- October 6, 2021*
ORS Hosts Webinar
- December 31, 2021*
Final Report Released by ORS

Final Recommendations

Based on the Evaluators' assessment of the State's natural gas and electric Utility Providers' ability to respond to extreme winter weather events and meet peak customer demand, the Evaluators recommend the following actions be considered:

- 1** Electric and natural gas Utility Providers should strengthen existing procedures for cold weather preparedness, planning, engineering, operations and coordination to prevent extended interruptions in natural gas and electric service. Procedures should provide enhanced and enforced operations and maintenance to mitigate disruption. For entities that are under the purview of mandatory NERC Reliability Standards, see Recommendation No. 3 for the voluntary adoption of the Public Utility Commission of Texas rules.
- 2** Electric Utility Providers should evaluate bulk power system reliability under more extreme conditions than required by NERC and SERC to include:
 - a.** Extended cold weather conditions more stringent than SERC's winter criteria (e.g., higher loads and colder temperatures).
 - b.** Loss of a greater number of transmission lines than those specified in NERC transmission planning contingency criteria.
- 3** South Carolina should form a task force to evaluate the voluntary adoption of practices comparable to those recently adopted in Texas. Refer to the legislatively mandated rules instituted around winter storm planning and requirements for Generation Entities and Transmission Providers.
- 4** Electric Utility Providers should adopt the current codes and industry best practices, hardening for greater storm resiliency, and designing for the future. Priority should be targeted at respective systems most susceptible to winter-related outages – apply enhanced design standards for equipment and facilities damaged in the recent storms and/or major events. To harden the transmission and distribution (T&D) infrastructure, physical and structural improvements to lines, poles, towers, substations, and supporting facilities will be needed to make them less vulnerable to the damaging effects of winter-related events.
 - a.** Electric Utility Providers should determine and enforce safe loading requirements for distribution poles based severe winter weather risks – specifically those used to carry both electric and telecommunications infrastructure.
- b.** Electric Utility Providers should evaluate strategic, targeted undergrounding of distribution lines in limited, appropriate circumstances based on the exposure to the threat of severe winter events.
- 5** Natural Gas Utility Providers should consider updates to Distribution Integrity Management Plans (DIMP), Transmission Integrity Management Plans (TIMP), operations and maintenance manuals and design standards to include specific adverse winter weather risk evaluation and mitigation actions.
- 6** Electric and natural gas Utility Providers are encouraged to collaborate with each other to develop a set of standard emergency preparedness and operating practice guidelines to provide consistent levels of service reliability to all South Carolina electric and natural gas customers. Guidelines may initially be voluntary and evolve to mandatory, once matured.
- 7** All electric and natural gas Utility Providers should be required to participate in adverse winter weather emergency drills and/or tabletop exercises with state and local emergency management agencies in their respective emergency management planning cycles. The State should consider including propane providers and petroleum pipeline providers in adverse winter weather emergency drills and/or tabletop exercises.
- 8** Electric and natural gas Utility Providers should consider the feasibility of a study on the costs/benefits of resiliency and reliability enhancements and, as part of that study, consider whether there are any federal funding opportunities.
- 9** Electric and natural gas Utility Providers should actively participate in regional and national industry groups such as Electric Power Research Institute (EPRI), American Gas Association (AGA), Southeastern Electric Exchange (SEE), Municipal Association of South Carolina (MASC), and Carolinas Public Gas Association (Carolina SPGA).
- 10** South Carolina should assess the interdependencies between electric power and other key infrastructure (e.g., water, wastewater, telecommunications, transportation, etc.) to identify and address additional extreme cold weather and event response vulnerabilities.