The 2017 Hurricane Season:
A Review of Emergency Response and Energy Infrastructure Recovery Efforts

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Testifying on behalf of the
Electricity Subsector Coordinating Council

The 2017 hurricane season highlights the critical importance of cooperation and coordination among electric companies, the government, and other key infrastructure industries to ensure fast, efficient recovery for customers. There is an understandable urge to compare storms, but the reality is that each storm is different. The common threads, however, are the need for resilient infrastructure, a plan for response and recovery, and the awesome nature of our industry's ability to respond to emergencies.

The electric sector faces constantly evolving threats to the energy grid. The industry's risk mitigation strategy emphasizes a "defense-in-depth" approach. We focus on preparation, prevention, response, and recovery, with an emphasis on isolation of, and enhanced protections for, critical assets. While this hearing is focused on storm response and recovery, it is important to note that our companies do not build the energy grid or our security responses to meet only one type of threat. We must prepare and plan for them all, whether manmade or natural, malicious or unintentional, relating to cyber or physical security, or a combination of threats.

Weather is an unavoidable part of our business. In the aftermath of events, the industry works to identify gaps, compile lessons learned, and disseminate best practices. As an industry, we strive to be better today than we were yesterday, and to be better tomorrow than we are today.

Since Superstorm Sandy five years ago this week, the electric power industry has combined efforts across all segments of the industry and has worked with government partners to streamline restoration efforts and to improve preparation for and response to major events that cause significant outages. The benefits of this coordination were visible over the past several months, as the industry and federal government worked to prepare for and respond to the hurricanes.

Congressional Testimony

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Testimony before the

Subcommittee on Energy

Committee on Energy and Commerce

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Chairman Upton, Ranking Member Rush, and Members of the Subcommittee, thank you for inviting me to testify today. My name is Tom Fanning, and I am the chairman, president, and chief executive officer of Southern Company, but I'm appearing before you today in my role as a co-chair of the Electricity Subsector Coordinating Council (ESCC).

I also am the immediate past Chairman of the Edison Electric Institute (EEI). EEI is the association that represents all U.S. investor-owned electric companies. EEI's member companies provide electricity for 220 million Americans and operate in all 50 states and the District of Columbia.

The electric power industry—which includes EEI's members and the members of the American Public Power Association (APPA) and the National Rural Electric Cooperative Association (NRECA)—supports more than 7 million American jobs and contributes $880 billion annually to U.S. gross domestic product, about 5 percent of the total. APPA, EEI, and NRECA also come together to chair the ESCC. I serve as one of three co-chairs of the ESCC; my fellow co-chairs are Duane Highley, President and CEO for Arkansas Electric Cooperative Corp. and Arkansas Electric Cooperatives, Inc., and Kevin Wailes, CEO of Lincoln Electric System in Nebraska.

The ESCC serves as the principal liaison between the electric sector and the federal government for coordinating efforts to prepare for, and respond to cybersecurity threats, physical terrorism, and natural disasters that imperil critical infrastructure. The ESCC includes electric company CEOs and trade association leaders representing all segments of the industry. Their counterparts include senior Administration officials from the White House, relevant Cabinet agencies, federal

law enforcement, and national security organizations. The ESCC is where these senior leaders from industry and government come together to set strategy and priorities on the security, resiliency, and responsiveness of the industry and, by extension, the nation.

I am pleased to address the Subcommittee today to share what steps the electric power industry is taking to make energy infrastructure stronger, smarter, and more resilient to continue delivering the safe, affordable, secure and reliable power that Americans count on.

The electric sector faces constantly evolving threats to the energy grid. The industry's risk mitigation strategy emphasizes a "defense-in-depth" approach that focuses on preparation, prevention, response, and recovery, with an emphasis on isolation of, and enhanced protections for critical assets. While this hearing is focused on storm response and recovery, it is important to note that our companies do not build the energy grid or our security responses to meet only one type of threat. Whether manmade or natural, malicious or unintentional, relating to cyber or physical security, or a combination of threats, we must prepare and plan for them all.

This hearing comes in response to a series of devastating events. In August, Hurricane Harvey's high winds, torrential rains, and storm surge caused significant damage and catastrophic flooding in parts of Texas and Louisiana. Days later, Hurricane Irma devastated parts of the Caribbean, including the U.S. Virgin Islands and portions of Puerto Rico, and brought unprecedented damage to the southeastern United States. Every county in Florida was impacted by the storm, as well as parts of Alabama, Georgia, North Carolina, and South Carolina.

Following Irma, Hurricane Maria developed in the Atlantic Ocean as one of the strongest hurricanes on record. After impacting the U.S. Virgin Islands, Maria passed directly over Puerto Rico, knocking out power to the entire commonwealth. The work to restore power in Puerto Rico and in the Virgin Islands continues. Most tragically, each of these events resulted in the loss of life.

Weather is an unavoidable part of our business. In the aftermath of events, the industry works to identify gaps, compile lessons learned, and disseminate best practices. We have learned from these storms and from previous storms. As an industry, we strive to be better today than we were yesterday, and better tomorrow than we are today. Since Superstorm Sandy five years ago, the electric power industry has combined efforts across all segments of the industry and worked with government partners to streamline restoration efforts and to improve preparation for and response to major events that cause significant outages. The benefits of this coordination were visible over the past several months, as the industry and federal government worked to prepare for and respond to the hurricanes.

There is an understandable urge to compare storms, but the reality is that each storm is different. One common thread, however, is the need for a resilient infrastructure and a plan for response and recovery. Electric companies across the sector are making investments to harden the energy grid. As an industry, we plan and regularly exercise for a variety of emergency situations, including natural disasters that could impact our ability to provide electricity. In two weeks, thousands of participants from industry and government will participate in a biennial industry-wide grid security and incident response exercise known as GridEx; this iteration is GridEx IV.

As with the previous exercises, it will result in a report that identifies gaps and recommendations for industry and government. It will be another tool to strengthen our coordination and preparation.

Indeed, each storm is different. However, each of the recent storms is instructive to the benefits of investments in resiliency, the need to prepare, and the awesome nature of our industry's ability to respond to emergencies.

Harvey

Harvey, a Category 4 hurricane, was the first major hurricane to make landfall in the United States since Hurricane Wilma in 2005. The storm brought historic flooding to southeastern Texas, including nearly 52 inches of rain in some locations and strong winds in places not impacted by flooding. The daily peak outages during Harvey were around 350,000 customers. However, an estimated 1.4 million restorations occurred throughout Texas and Louisiana, due to flooding and the slow-moving nature of the storm that required multiple repairs. More than 10,000 electric power industry workers from at least 21 states mobilized to restore power to customers impacted by Harvey.

Irma

Irma, a Category 4 hurricane when it made landfall in Florida, was the most intense storm to hit the United States since Hurricane Katrina. More than 7.8 million customers were impacted in Florida, Georgia, Alabama, South Carolina, and North Carolina at the peak on September 11, 2017. More than 60,000 workers were involved in the restoration, coming from more than 250

electric companies across the United States and Canada. This was one of the largest power restoration efforts in U.S. history. That effort resulted in 95 percent of customers being restored within one week. The speed of the recovery was noted by the U.S. Energy Information Administration:

> "About 15% of customers were without power at noon on September 10, and power outages peaked at 3:00 p.m. on September 11, affecting 64% of customers. In contrast, Hurricane Wilma moved quickly across the southern part of the state, knocking out power to 36% of customers in Florida. Although the percentage of Florida customers without power during Irma was significantly higher than during Wilma, the rate of electric service restoration has been more rapid. Five days after Irma's landfall, the share of customers without power had fallen from a peak of 64% down to 18% (a recovery rate of about 9% of customers per day). Power outages during Wilma declined from 36% of customers to 16% by the fifth day after landfall (an average recovery rate of about 4% of customers per day). … Since 2005, Florida Power & Light and other utilities in the state have made significant investments to improve their hurricane preparedness. These utilities have upgraded electric infrastructure, including replacing wooden utility poles with concrete poles. Utilities have also deployed smart grid technologies, which provide more timely and more accurate information about outages and can help utilities better target restoration efforts." [1]

[1] https://www.eia.gov/todayinenergy/detail.php?id=32992

Maria

Maria was the second Category 5 storm of the 2017 season and caused widespread destruction to all infrastructure on Puerto Rico and the U.S. Virgin Islands, including the energy grid. Power restoration has been, and will continue to be, a challenging and complicated effort. The entire electric power industry continues to closely coordinate with its federal government partners to support these efforts. Unlike Hurricanes Harvey and Irma, mutual assistance has yet to be triggered in response to Maria. Mainland electric companies are ready to support the restoration and rebuild of Puerto Rico's infrastructure and provide any expertise, resources, crews, or materials needed to turn the lights on for our fellow Americans.

Nate

Nate made landfall on October 7 in southeast Louisiana and Mississippi as a Category 1 hurricane with winds of 85 mph. I mention Nate because it was notable for not causing widespread outages. Some may think that the region "dodged a bullet" because of the relatively minimal damage and impacts, with about 100,000 customers losing service during the storm. However, the quick response and recovery are in fact evidence that investments in resilient infrastructure and preparation pay off.

Prepare, Respond, Recover – The Role of the ESCC

Hurricanes like Harvey, Irma, Maria, and Nate draw attention to the critical importance of cooperation and coordination among electric companies, the government, and other key infrastructure industries to ensure fast, efficient recovery for customers.

Following Superstorm Sandy in 2012, the industry and government worked together to streamline restoration efforts and to improve how the sector prepares and responds to major events that cause significant outages. In October 2010, the National Infrastructure Advisory Council (NIAC) issued a report, "A Framework for Establishing Critical Infrastructure Resilience Goals," that included nine recommendations. The first recommendation was for the White House to "initiate an executive-level dialogue with electric and nuclear sector CEOs on the respective roles and responsibilities of the private sector in addressing high-impact infrastructure risks and potential threats…" That recommendation eventually led to the creation of the ESCC.

The ESCC is comprised of the CEOs of 21 electric companies and nine major industry trade associations. It includes all segments of the electric power industry, representing the full scope of electricity generation, transmission, and distribution in the United States and Canada. Each year, the ESCC convenes three coordination meetings with senior government officials to identify emerging security issues and to develop approaches to mitigate risk, including cyber and physical security. However, the ESCC is much more engaged than three formal meetings a year with the government. Those "blue sky" meetings help prepare the industry and government for response efforts. In between, there's constant work together leveraging industry and government executives and subject matter experts to develop numerous initiatives with the goal of improving the industry's preparedness and resilience. During incidents, the ESCC helps to coordinate efforts across industry and government in response to all hazards.

Over the past several years, this partnership has resulted in a number of important changes in how both government and industry work together to protect critical infrastructure. One outgrowth from the creation of this group is the ESCC Playbook – a framework for senior industry and government executives to coordinate response and recovery efforts and communications to the American public. The playbook has been tested in a series of exercises and informs our response and recovery efforts today.

Exercising the playbook means that the industry and our government partners can fix problems in real time during disasters. During the most recent storms, the ESCC held daily coordination calls among impacted companies and government officials to address critical operational issues such as identifying specialized equipment needs; removing temporary flight restrictions for both manned and unmanned aircraft to assist with aerial damage assessments; coordinating how industry could re-enter and access disaster areas; and coordinating response efforts with the oil and natural gas, telecommunications, transportation, and water and wastewater sectors. Department of Energy Secretary Rick Perry was on every call and was joined frequently by other officials such as Department of Homeland Security Acting Secretary Elaine Duke. These calls were essential to identifying and addressing critical issues in the response and recovery efforts.

Conclusions

The reliability and resiliency of the grid are of paramount importance. Our customers expect the lights to go on when they flip a switch. When power goes out, our customers expect that it will be on soon. The electric power sector will continue to strive to meet those expectations through a multi-layered strategy to invest in smarter energy infrastructure, continuous enhancement of our

industry-government partnership, and the grit of the amazing men and women who make the energy grid work day in and out.

The Subcommittee is showing great leadership with its focus on preparedness, and we look forward to working with you on this critical topic. Thank you again for the opportunity to testify on behalf of the ESCC, and I look forward to your questions.