Improving Electric Grid Reliability and Resilience

Lessons Learned from Superstorm Sandy and Other Extreme Events

GRIDWISE ALLIANCE

A Focused Mission

The GridWise Alliance is a consortium of passionate stakeholders focused on modernizing our electric grid. The alliance collaborates to transform the nation's electric power grid to achieve a sustainable energy future.

Thought Leadership

- **LEAD THE CONVERSATION:** Continue as the pre-eminent cross-industry collaborative to transform the electric grid and create value for all through policy development.

Advocacy

- **ADVOCATE FOR INVESTMENT AND INNOVATION:** Advocate policies to promote investment in infrastructure, innovation, and modernization of the electric grid.

Engagement

- **ENGAGE KEY CONSTITUENCIES:** Build the framework that supports the continued development of a sustainable energy future through active engagement with key stakeholders.

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Context

- Resilience and reliability must be enhanced, as extreme weather events increase.
- Digital economy/critical infrastructure systems are increasingly interdependent.
- Most grid modernization technologies that exist have been installed for daily operations rather than major events.

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Grid Modernization Technologies: Essential to Increasing Resilience and Reliability

- Requires a multi-pronged approach, including hardening of physical infrastructure
- Potential to significantly enhance reliability and resilience in a “Very Large Scale Event” (VLSE)
- Reduces the duration of outages

GWA Report Recommendations
5 Focal Areas

1. Deploy grid modernization technologies to greater extent
2. Improve emergency response planning processes
3. Enhance Information Communications Technology Infrastructure
4. Leverage systems, capabilities, and processes to improve communications and speed power restoration
5. Expand the use of distributed generation to enhance resilience

Deploy Grid Modernization Technologies to a Greater Extent

- Grid-related technologies that help prevent and reduce the duration of outages when they do occur can result in dramatic cost savings.
  - Advanced Metering Infrastructure
  - Substation flood Monitoring
  - Phasor Measurement Units

Integrating AMI meters with restoration processes shaved 2–3 days off the time it would have taken to completely restore power during VLSEs; a 10–15 percent improvement in speed of restoration

Improve Emergency Response Planning Processes

- Develop enhanced damage prediction models incorporating advanced weather modeling.
  - Electric utilities, working with state and federal agencies, should develop predictive restoration plans at a regional level
- Joint simulations, drills, and related “pre-event” scenario planning efforts should be conducted across critical infrastructure sectors and levels of government to test plans and strengthen capabilities to collectively respond to VLSEs – incorporating grid modernization technologies.

Enhance Information Communications Technology Infrastructure

- Information and Communications Technology (ICT) infrastructures should be more resilient, reliable, and secure.

- Electric utilities should be granted priority access to communications infrastructure to communicate with equipment and field resources during major events.

- Ability to communicate/interoperability between systems used by host utility and “mutual assistance” resources is vital.

Leverage Systems, Capabilities, & Processes to Improve Communications & Speed Restoration

- Investments in grid modernization technologies and capabilities can be leveraged to enhance communications *from* utilities to their customers and other stakeholders and *into* a utility from customers and others.

For utilities:

- Integrate new field intelligence processes, tools and data to rapidly and accurately pinpoint damage
- Leverage Advanced Metering Infrastructure ("smart meters") to increase "situational awareness" and improve targeted communications
- Maximize remote sensing and control capabilities

Leverage Systems, Capabilities, & Processes to Improve Communications & Speed Restoration

- Social media can be used before and during major outage events
  - Estimated times of restoration
  - help ensure consistent messaging,
- Emergency officials and the public should share satellite photos, GIS/GPS data, surveillance videos, and images from social media with utilities and their crews to help pinpoint outage locations more accurately and save time, money, and truck rolls

Expand the Use of Distributed Generation to Enhance Resilience

Policy makers, regulators, and utilities should work together to:

- Enhance monitoring and control capabilities to effectively dispatch DERs; and,
- Identify potential solutions to enable multi-customer microgrids.

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