

ADVANCED ENERGY GROUP – MARCH 14, 2019
RESILIENCY, CRITICAL INFRASTRUCTURE, AND MICROGRIDS

LIFELINE INFRASTRUCTURE AND COMMUNITY RESILIENCE

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LIFELINES “MAKE OR BREAK” OUR LIFESTYLE

Petroleum



Electricity



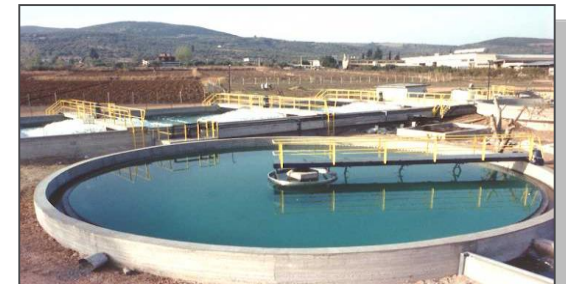
Transportation



Communications



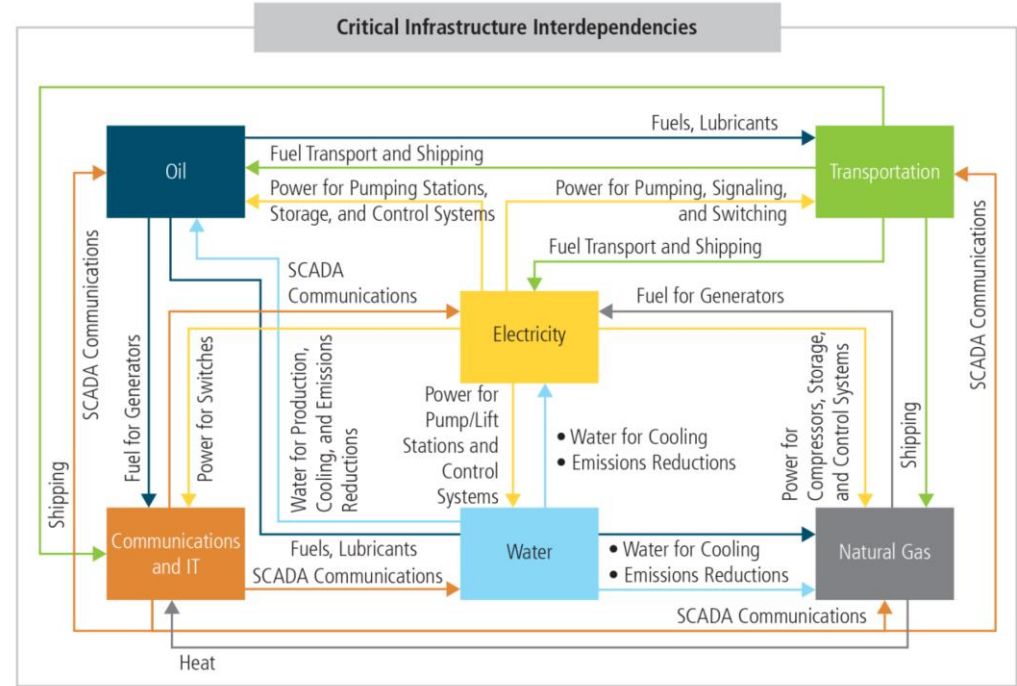
Natural Gas



Water/Wastewater

INTERDEPENDENCIES ARE COMPLEX AND INTERRELATED

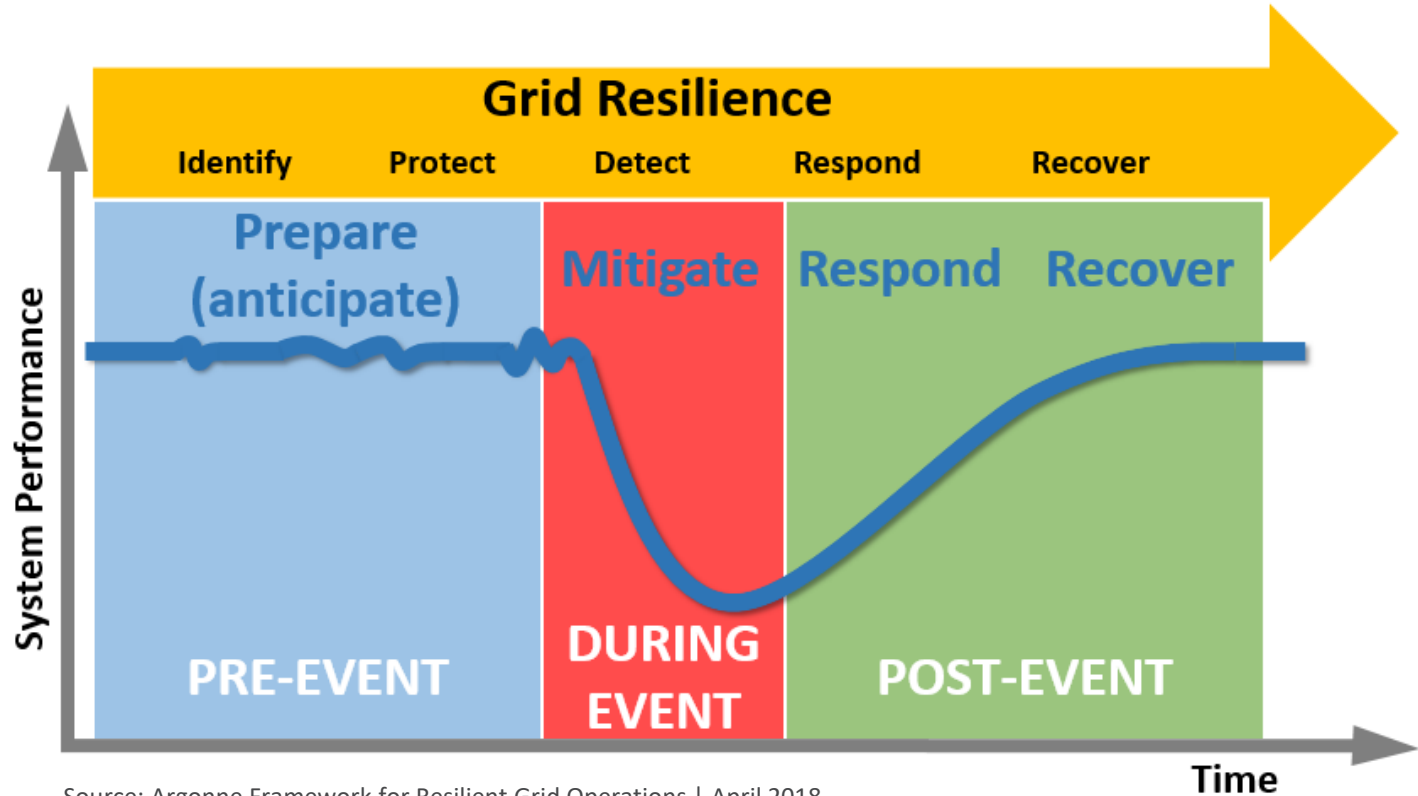
- Lifeline infrastructure system **interdependencies act as a risk multiplier** and further complicate lifeline and community resilience assessment and mitigation.
- **Now, add in emergency management, public health, and additional community perspectives into the resilience equation!**



Sources: Peerenboom et al. 2001, Argonne 2016, DOE 2017 QER

- Objectives** →
- Anticipate Consequences
 - Enhance Resilience Capabilities
 - Decrease Vulnerabilities
 - Decrease Risk

WHAT HAPPENS WHEN THINGS BREAK?



Source: Argonne Framework for Resilient Grid Operations | April 2018

Collaboration, through exercises and drills, helps to answer this multifaceted question.

PREPARATION REQUIRES A BROAD RANGE OF CROSS-SECTOR AND COMMUNITY RESILIENCE CAPABILITIES

From Scenario Definition to System Restoration

Scenario or
Threat
Definition



Physical
Impact
Assessment



System
Modeling

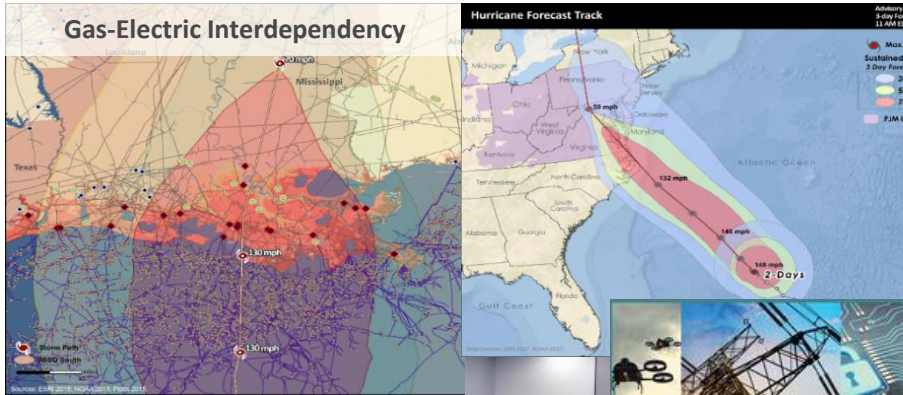


System
Restoration
and Response
Modeling



The foundational basis for exercises must be defensible to ensure effective collaboration.

EXERCISES FACILITATE DISCOVERY AND TRANSFORM KNOWLEDGE



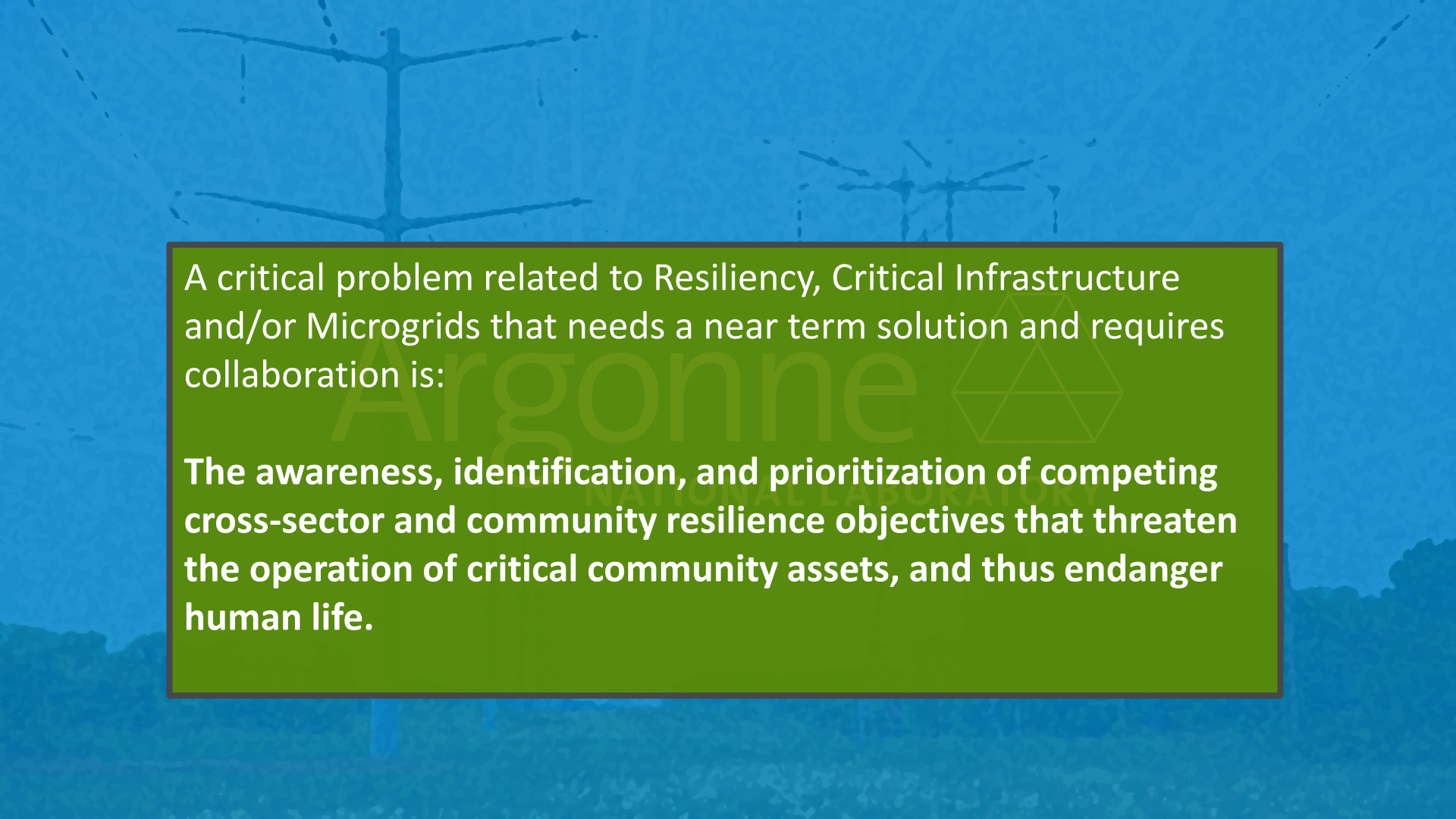
Cyber Defense Competition 2017

ComEd Operation Power Play – #POWERPLAY2019



"And to help us better simulate a real emergency, we've hired a special team of disaster experts."

Collaborate to understand interactions, identify concerns, propose lessons learned, and establish effective policies.



A critical problem related to Resiliency, Critical Infrastructure and/or Microgrids that needs a near term solution and requires collaboration is:

The awareness, identification, and prioritization of competing cross-sector and community resilience objectives that threaten the operation of critical community assets, and thus endanger human life.