



Grid Resiliency and Physical Security

Resiliency Program – Infrastructure Hardening and Recovery Strategy

Reliability is a well understood concept, but resiliency is relatively new. The effectiveness of a resilient infrastructure or enterprise depends upon its ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event. Examples of events that test a system's resilience include severe natural events (wildfires, hurricanes, floods, droughts, and earthquakes) and coordinated, extensive physical and cyber-attacks and geomagnetic disturbances on the electrical, or the supporting telecom and gas infrastructures.

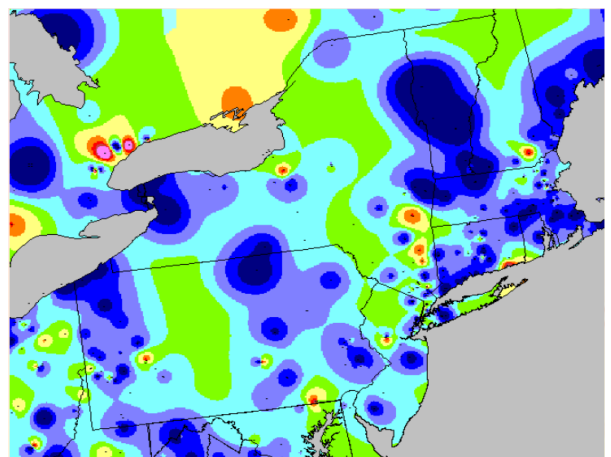
Resilience is typically achieved through hardening or recovery. Hardening refers to physically changing infrastructure to make it less susceptible to damage. Hardening improves the durability and stability of energy infrastructure, making it better able to withstand the impacts of hurricanes, weather events or attacks. Recovery, by contrast, refers to the ability of an energy facility to recover quickly. This includes identifying and addressing aging infrastructure, pre-emptive planning and design for extreme events, operating strategies and well-maintained recovery plans. Special Protection schemes are also being considered as a valuable tool to complement the operator actions and support grid recovery

Service Offerings

Our most recent works include supporting clients with identifying the most vulnerable locations in their system, evaluating their impacts, classifying their criticality, supporting compliance audits and developing mitigation strategies. Our works cover a spectrum of resiliency driven analysis including wildfire risks, earthquake vulnerability, gas disruption scenarios, CIP-014-2 requirements (R1 & R2), extreme weather and aging infrastructure. A combination of our in-house tools and commercial software enable analysis that is structured to address all attributes of the resiliency problem. A combination of heuristic analysis, deterministic verification and probability assessments ensure all risk elements are considered.

Typical Service Offerings

- Developing a detailed grid resiliency program.
- Identifying of vulnerable bulk electric system facilities including substations and protection systems.
- Quantitative and Qualitative assessment of the risks associated with substation vulnerability classifications.
- Detailed modelling of gas-electric interdependencies and simulation of extreme events or scenarios.
- Modeling and Design of Special Protection Schemes.
- Probabilistic risk assessments to quantify the impact of aging infrastructure on system resiliency.
- Inspecting facility design and its potential risk to physical and cyber-attack.
- Identifying the equipment and components at the highest risk of attack from someone with knowledge of the electric system.
- Assessing the types of attacks that can be realistically contemplated at our client's sites.
- Identifying potential mitigations of component risks and protection strategies.
- Providing insights into design and construction of appropriate facilities to address your physical security concerns.





Grid Resiliency

- **Asset Vulnerability**
- **Criticality Classification**
- **Risk Assessment**
- **Compliance Audits**
- **Mitigation Strategy**
- **Aging Infrastructure**
- **Equipment Standards**
- **Operating Plans**
- **Special Protection**

Why Quanta Technology?

Quanta Technology has assembled an impressive team of industry experts in the areas of regulatory compliance, substation design and construction, protection and control, system planning, communications and remediation/mitigation design to assess and provide solutions to grid vulnerability, including physical attacks on substations. Our team of seasoned professionals offers outstanding credentials and is among the most experienced in the industry. Quanta Technology has real world, relative experience with numerous projects to manage aging infrastructure, asset hardening and experience with physical security and wildfires.

Robust Solutions

Our risk assessment can be used by utilities to identify mitigation measures to address electric system vulnerabilities. Quanta Technology will work closely with its clients to identify the assets (i.e., substations, transmission lines, transformers, communications, system protection, gas infrastructure etc.) to be evaluated. We have extensive experience and tools to assist with identifying the criticality of not only the electric grid but the impacts of each of its components.

The time for planning grid resiliency is now, and Quanta Technology has been ready with the expertise and experience to harden the infrastructure and strategize the recovery.



About Quanta Technology

Quanta Technology is an independent technology, consulting, and testing company providing business and technical expertise, along with advanced methodologies and processes, to utilities and others in the power and energy industries. Our mission is to provide unparalleled value to our clients in every engagement across the value chain by using advanced software and hardware, laboratories, and custom tools for a holistic approach to practical service and the most insightful thought leadership in the industry.

For Additional Information Contact:

Northeast (USA) and Québec

Mike Longrie: MLongrie@Quanta-Technology.com

South/Southeast (USA) and Ontario

Diana Prkacin: DPrkacin@Quanta-Technology.com

Central (USA and Canada)

Evan Estes: EEstes@Quanta-Technology.com

West (USA and Canada)

Reza Nasri: RNasri@Quanta-Technology.com

International (outside USA and Canada)

David Elizondo: DElizondo@Quanta-Technology.com

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