STRATEGIES TO IMPROVE SYSTEM RELIABILITY - PART 2

SYSTEM RESILIENCE

PART 2 OF 3

In the age of wireless communications and constant reliance on network connectivity, society is becoming less and less tolerant to even the shortest of power outages. Each and every one of the outages you experience may cost your utility or your community millions of dollars. This threat raises several questions about your power system. How many customers experience power outages? How quickly can power be restored? Is there enough system redundancy to sustain power operations when major critical outages occur? How much money will a sustained outage cost your community? How RESILIENT is your power system?

What exactly does system resilience mean? The U.S. Department of Energy (DOE) and NERC define system resilience as “the ability of a [power] system or its components to adapt to changing conditions and withstand and rapidly recover from disruptions, whether deliberate, accidental, or naturally occurring.” Simply stated, it refers to your systems ability to sustain power supply in the event of unexpected changes. These sudden changes can come in a wide variety, including but not limited to:

- Power Surges
- Weather Damage
- Infrastructure Failure
- Renewable Integration
- Demand Management and Response
- Loss of Generation or Substation
- Operation of Protective Devices
- Cyber and Physical Attacks

While these issues may not occur every day, the risk to your system is persistent and is always present. Furthermore, any one of them can strike at any given time. Therefore, it is imperative to build adequate resiliency into your power system in order to adapt to and recover from system outages, as well as to provide a continuous supply of power despite these outages.

A resilient power system addresses several key elements. It incorporates key characteristics, commonly referred to as “dynamic response capabilities”. By definition, dynamic response capabilities are designed to detect, analyze, adapt, and respond to the conditions outlined previously, there by providing continuous power to your distribution network. By design, resilient system is very flexible. It is capable of minimizing the number, frequency and length of service disruptions. Some key performance indicators for your system’s level of resilience include its ability to withstand the impacts of a service disruption, maintain balance through an event, recover from the event, and prepare for the next event.

The benefits of having a resilient power system extend beyond rapid event responses, outage recovery, and sustained power supply. Utility companies will have an enhanced ability to perform damage assessment, asset management, system design, system planning, demand response, demand management, and future system enhancements. Having a resilient system will provide for seamless and automated system adaptations to address short term items, such as, increased demand, peak loading, and intermittent renewables, as well as more long term items, such as, integration of distributed generation sources electric vehicle charging stations.

System resilience should not be neglected. It is one of the major factors that contribute to overall reliability. Building automated system responses and adaptability into your power system is a wise investment for seamless integration of smart grid capabilities. Finley Engineering has a track record of helping utility companies incorporate resilience into their power systems. We can do the same for you.

View part 1 in this three part series here:

http://finleyusa.com/whitepapers/energy/strategies-to-improve-system-reliability-part-1-of-3/

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