

Mitigating Wildfire Risks: Proven Strategies for Utilities



INTRODUCTION

In today's dynamic energy landscape, ensuring reliable and efficient power delivery while mitigating wildfire risks is a paramount concern for utilities. The increasing frequency and intensity of wildfires necessitate proactive measures to safeguard communities and infrastructure. That's why utilities are moving to adopt distribution automation (DA) systems and upgrading equipment to include current limiting protectors as well as improved reclosers and sensors. **Combined with expert support from trusted suppliers, these moves enable utilities to mitigate wildfire risks more effectively within their distribution systems.**

Understanding Wildfire Risks

When it comes to power grids, wildfire risks run in both directions. Grid faults can inadvertently spark wildfires, while wildfires pose significant threats to power grid equipment and personnel no matter the cause. These threats include:

Direct damage

Infrastructure damage from wildfires can include downed power lines, destroyed transformers and compromised substations, leading to widespread outages and potential ignition points for further fires.

Indirect impacts

Smoke and ash from wildfires can disrupt critical communication systems and sensors within the grid, hindering situational awareness, hampering restoration efforts and increasing health risks for employees in the field.

Equipment Upgrades for Wildfire Mitigation

The following equipment upgrades can combine to greatly enhance a utility's wildfire mitigation efforts:

G&W Electric's CLiP® current limiting protectors combine the benefits of circuit breakers and overcurrent protective devices to deliver reliable multi-hazard electrical protection that helps keep workers and equipment safe from arc flashes and system damage. These protectors mitigate wildfire risk by clearing faults in less than ½ of an electrical cycle. The fast clearing time of CLiP® protectors reduces arc flash incident energy by 90% relative to a 5-cycle breaker and 83% relative to a 3-cycle breaker.

- Common applications for CLiP® protectors include arc flash energy reduction, power transformer protection and protecting overdutied equipment by limiting current.

Viper-ST reclosers or similar protective devices can easily coordinate with CLiP® current limiting protector, as the protector is programmed to trigger at a customer-selected instantaneous current value. Users typically have no issues with coordination as a result.

- Reclosers minimize fault duration through faster trip times, which is particularly crucial in extensive overhead distribution systems. That reduced trip time has been proven to reduce the risk of wildfires.
- The Viper®-ST recloser, with its solid dielectric technology and dead-front operation, provides additional safety and reliability benefits. A magnetic actuator system provides local and remote operation of the recloser on battery backup if AC source power is lost or interrupted. And built-in wildlife protectors reduce the threat of wildlife-caused wildfires.

A robust array of medium-voltage sensors provides real-time data and insights on voltage levels, power quality and fault identification. This improved monitoring enables utilities to make informed decisions, reduce downtime and improve overall performance.

- Utilities can use continuous sensor data to assess equipment health and predict maintenance needs as well. Sensors also can be deployed to monitor weather conditions, such as wind speed and humidity, which can exacerbate wildfire risks.

Distribution Automation Systems Enhance Wildfire Risk Mitigation

A growing number of utilities are adopting DA systems, such as G&W Electric's LaZer® automation system, that offer benefits such as improved system reliability, enhanced crew safety and reduced outage durations—all of which help mitigate wildfire risk.

DA involves the integration of intelligent devices, communication networks and software applications to automate various tasks on the grid. It enables utilities to respond more quickly and accurately to system events. With DA, if a fault occurs, power can be restored to unaffected areas prior to a truck being sent to repair the damaged or faulted area or device.

Utilities seeking a reliable DA solution should evaluate G&W Electric's patented single-phase fault location, isolation, and service restoration (FLISR) technology. FLISR automatically identifies faults, isolates them from the rest of the system, and restores power to affected areas in minutes, seconds or even cycles, significantly reducing outage times.

- **Communication schemes are not required to implement FLISR**, but they enhance automation capabilities by offering real-time insights for swifter and more sophisticated responses, especially with a larger number of devices. Non-communicating loop schemes also can be implemented such that reconfiguration decisions are based on voltages, currents and operations within the circuit (typically limited to 15 devices). The LaZer® automation platform can handle both types of schemes.
- **G&W Electric can provide either script- or model-based automation options.** They have experience implementing automation on single switches and multi-loop configurations. While script-based solutions rely on preprogrammed logic, model-based solutions leverage real-time data and system modeling for dynamic adaptability. The choice between the two hinges on the scale of your current system, the need for future scalability and the complexity of user-definable contingencies.
- **When bringing a new DA platform online, G&W Electric offers full integration of new and existing components**, including switches, relays, communication system, and supervisory control and data acquisition (SCADA). They offer seamless, single-contact integration with existing infrastructure, as well as a vendor-agnostic third-party approach to implementation that facilitates integration for utilities with diverse infrastructure components.

How Upgraded Equipment and DA Systems Work Together to Mitigate Wildfire Risk

The CLiP® current limiting protector works by detecting and rapidly reducing the voltage and current of downed power lines to prevent sparking. It then sends a signal to the upstream Viper®-ST recloser to open and clear all three phases. At the same time, CLiP® current limiting protector can send a signal to the LaZer® automation platform to compensate for the downed lines, reducing the risk of customer outages. All these functions are supported by the sensor-based real-time monitoring system.

Taking Steps Beyond Infrastructure Upgrades

Utilities that operate in regions with high wildfire danger should consider adopting additional risk mitigation efforts, such as:

Vegetation management

Regular vegetation management around power lines can play a crucial role in preventing wildfires.

Community collaboration

Utilities can collaborate with fire departments, local authorities and surrounding communities to develop comprehensive wildfire mitigation plans and communication strategies.

Public awareness

Educating the public on wildfire risks and safe practices can help prevent accidental ignitions.

A Proactive Safety Partnership

G&W Electric's commitment to innovation and reliable solutions empowers utilities to effectively mitigate wildfire risks within their distribution systems. By combining advanced equipment and technology, state-of-the-art DA systems and a comprehensive understanding of wildfire risks, utilities can enhance the safety, reliability, sustainability and resiliency of their power grids all while protecting the communities they serve from wildfires and many other risks.

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