

Wildfire Mitigation and Prevention with 900 MHz Private Wireless Broadband

Addressing extreme weather and natural disasters is a major goal of grid modernization initiatives. In many regions across the country, the need for utility wildfire mitigation solutions has become increasingly urgent.

Technology and the communications network that supports the grid play a key role in helping utilities address these growing concerns. Today, a variety of solutions, technologies, and tools have emerged to aid utilities in mitigating disasters and wildfire risks. These solutions increase customer satisfaction and improve operational metrics by lessening outage duration and frequency and reducing customer impact.

Wildfires

Innovative proactive detection, prevention, and mitigation solutions have surfaced in the past decade. These include weather stations with environmental sensing, video cameras with thermal imaging capabilities, drones, smart irrigation, vegetation management, remote monitoring of power lines, and other advancements. These solutions aim to detect wildfire risks, minimize their impact on the electric grid, and save lives while mitigating property damage caused by wildfires. Through the adoption of these solutions, utilities can enhance reliability, improve customer satisfaction, expedite early detection, facilitate rapid de-energization, and enhance operational metrics.

For example, **Falling Conductor Protection (FCP)** enables utilities to proactively enhance resiliency by promptly detecting a broken conductor and de-energizing the line before it contacts the ground, utilizing a near real-time connection. Targeted rapid de-energization of the line in less than 1.3 seconds can be achieved for specific at-risk communities, utilizing the low-latency and traffic prioritization capabilities inherent in a 900 MHz private wireless communications network. Remote monitoring and control of substation/distribution equipment, along with remote video surveillance and assistance in emergency response and mutual aid, illustrate further capabilities of a 900 MHz private wireless network in wildfire prevention and mitigation.

There are also technologies that can detect foliage or other objects interfering with a line and provide alerts. For example, dynamic line rating helps to improve resiliency by providing real time visibility of transmission lines. Advanced LiDAR technology provides line visibility and monitoring enabling utilities to deliver more power over existing lines while also detecting real

time movement in lines to help prevent a potential breakage from slap and minimizing galloping or other anomalies.

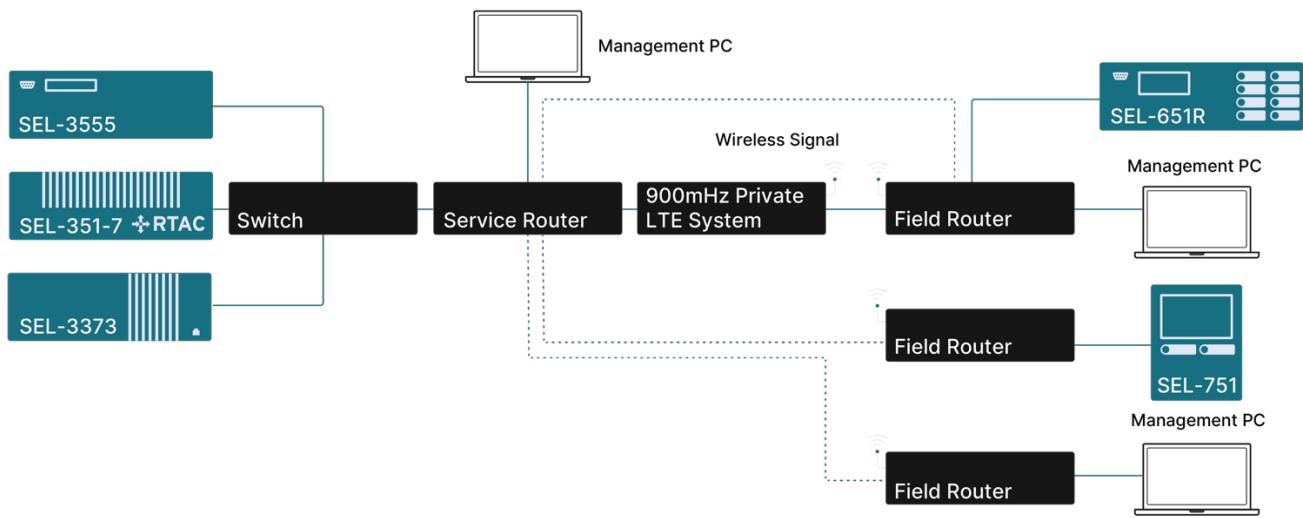
900 MHz private wireless is the foundation for the high-bandwidth, low-latency communications essential to support disaster mitigation and grid evolution. It is the ideal solution especially for remote areas lacking commercial wireless coverage or areas prone to fire outbreaks.

End-to-End Quality of Service and Control: With a 900 MHz private wireless network, utilities have full control of the design, construction, and operation of their network. Utilities retain control over data traffic prioritization, facilitated through a range of quality of service (QoS) class identifiers (QCI), allowing for critical traffic management features including priority, latency, and maximum packet loss rate. This allows utility mission-critical applications to be prioritized, even in situations when other networks become overloaded or experience disruptions. Such control fosters heightened efficiency, resiliency, security, and responsiveness.

Capabilities enabled by 900 MHz private wireless broadband:

Alarming of Downed Energized Conductor via Smart Meters	High Impedance Fault Detection (HIF)
Autonomous Vegetation Management	Integrating DERs with Advanced Distribution Management Systems (ADMS) for Public Safety Power Shutoffs (PSPS)
Distribution Fault Anticipation	Microgrids to Limit Service Interruption (vs. PSPS)
Environmental Sensors	Video Surveillance and Thermal Detection
Falling Conductor Protection (FCP)	Weather Station Data

The 900 MHz private wireless broadband architecture facilitates traffic prioritization, ensuring the delivery of critical data during disasters to support vital applications such as falling conductor protection



Spotlight: Anterix Active Ecosystem Members

Some of the Anterix Active Ecosystem members offer solutions which, while not always specifically designed to address wildfire mitigation, can be considered by utilities seeking a comprehensive approach:

Atomation: Atomation offers simple yet effective monitoring options for utilities. Atoms are easily installed, immediately operational on most equipment types, and send immediate alerts when anomalies are detected outside the tolerance range. Atoms measure temperature, tilt, impact, vibration and EMF, providing utilities with a new tool for monitoring critical equipment in the field.

GE Vernova: GE Vernova's fire mitigation solutions put protecting people and property at the forefront. Its GridNode High-Speed Falling Conductor Protection solution detects and isolates broken overhead line conductors before they hit the ground, reducing the risk of fire ignition. High-speed low-latency communications is a critical aspect of our falling conductor solutions.

GridWide Fire-Spy: GridWide Fire-Spy involves the use of rapidly installed, patented intra-grid sensors being deployed upon existing distribution transformers. The locations, heights, and deployment density of existing overhead transformer fleets present a unique opportunity, creating a ubiquitous, community-wide, "Always-On" overhead monitoring solution. Cellular backhaul facilitates early detection, auto alerts, and GPS coordinates features afforded by this novel wildfire mitigation solution.

Schweitzer Engineering Labs: The SEL falling conductor protection (FCP) application depends upon reliable, low-latency broadband communications to de-energize broken distribution power lines as they fall, eliminating the risk of wildfire caused by arcing of live wires on the ground. SEL has tested this application in a test bed environment over a 900 MHz private LTE network to successfully de-energize the affected circuit section within one second—less than the time it takes for a broken conductor to fall to the ground, typically a distance of 25 feet.

Sentient Energy: Sentient Energy combines advanced analytics from intelligent line sensors to mitigate wildfire ignition risk. Sentient Energy's predictive MM3ai solution alerts utilities of system concerns with equipment failure or vegetation encroachment that would cause system fault or fire ignition. Utilities are able to make data-driven decisions and take proactive actions to correct system concerns, thereby preempting outages and enhancing their wildfire mitigation strategy.



Reach out to the Anterix Active Ecosystem team at AnterixActive@anterix.com for additional information on our wildfire mitigation solutions members.