

A New Communication Path for Digital Fault Recorder Data

Virginia | *Deployed on 4G LTE Wireless Network*

SCENARIO

Utilities need data to know if electrical faults and other events threaten their power systems and when and where to send field crews for diagnosis and repairs. Dominion Energy Virginia uses high-resolution voltage and current measurements from digital fault recorders (DFRs) and traveling wave systems (TWS) to collect this information.

Data flows over optical fiber networks at substation sites where possible. But last-mile optical fiber isn't always available—and can't be economically justified—through some areas of Dominion's territory, like the mountainous terrain in the west.

SOLUTION

Dominion's solution: Use cellular 4G LTE modems to connect with DFRs, TWS, power relays, and substation clocks, for real-time responses to emergency events and data analysis afterwards.

For continuously streaming data and large data sets, Dominion recommends a faster 5G wireless network. This captures data and achieves the low latency needed for testing synchrophasor systems.

To maximize bandwidth requirements for telecom utility circuits at substations, the team explored vendor upgrades to 100 MB and integrated its control center to a Software-Defined Wide Area Network (SDWAN).

“With smart grids and smart buildings, an estimated 67.9 MMtCO₂e of emissions can be abated cumulatively in the United States by 2025, equivalent to CO₂ emissions from electricity generated to power 12 million homes in a year.”

(“5G Connectivity A Key Enabling Technology to Meet America's Climate Change Goals” – an Accenture report commissioned by CTIA)

RESULTS

With the new solution, Dominion is now able to access field measurements and verify equipment status without sending technicians on site.

Dominion discovered that cellular modems are often a cheaper solution than installing new fiber for smaller-bandwidth, low-data applications. What's more, the low-cost model of cellular modems enables multiple modems and networks within the same site—effectively making bandwidth extensible and giving multiple groups the ability to independently manage their own traffic.

HOW CAN SMART ENERGY DELIVER HUGE ENVIRONMENTAL BENEFITS?

With IoT integrated into generation, transmission and distribution equipment, energy companies and utilities can monitor and manage their operations remotely. Such smart grid technologies are bringing distributed energy resources to the grid and accelerating the transition to an economy that's sustainable and renewable-powered. It's estimated that these technologies can save 6.3 billion megawatt-hours (MWh) by 2030.

(AT&T)

