Arkansas Valley Electric Cooperative

Modernizing the Rural Grid with Itron's Fiber-Enabled AMI and DA

OVERVIEW

Arkansas Valley Electric Cooperative Corporation (AVECC) serves nearly 63,000 members across rural Arkansas and Oklahoma, operating more than 6,000 miles of electric distribution infrastructure in challenging terrain. AVECC had previously deployed a comprehensive fiber network to support future Smart Grid initiatives while also leveraging that infrastructure to provide FTTH broadband services to its members.

With fiber widely available, AVECC's next phase of modernization focused on extending grid automation and operational visibility beyond the substation fence to downline distribution automation (DA) assets such as reclosers, voltage regulators and capacitor banks. These assets are connected directly over AVECC's utility-owned fiber network, independent of the advanced metering infrastructure (AMI) system, which was not scheduled for replacement for several more years.

Through a strategic partnership with the National Rural Telecommunications Cooperative (NRTC), AVECC aligned its DA communications initiative with a longer-term AMI modernization strategy and secured approximately $18 million in federal funding as a single, integrated grid automation project. This funding enabled AVECC to modernize both DA and AMI in parallel, with deployments currently underway across the service territory.

BACKGROUND

Prior to this initiative, AVECC's legacy AMI system used Power Line Carrier (PLC) communications. While effective for basic operations, the architecture limited bandwidth, latency and scalability—especially as AVECC sought to extend communications to support more advanced grid monitoring and control.

AVECC leadership identified fiber-based communications as a unifying platform for both DA and AMI, enabling low-latency, near-real-time visibility and a scalable, future-ready grid architecture.

CUSTOMER

Arkansas Valley Electric Cooperative

SERVICE TERRITORY

- Rural Arkansas and Oklahoma
- ~63,000 members
- 6,000+ miles of distribution lines

CHALLENGES

- PLC performance constraints
- Difficulty reaching DA devices
- Growing operational complexity
- Misaligned AMI replacement timing
- Need to better leverage AVECC's existing fiber investment

TECHNOLOGY

- Itron Fiber Mini Access Point (Fiber MiniAP) for AMI Backhaul
- Itron Gen5 Riva meters (AMI)
- Utility-owned fiber network supporting independent DA communications

KEY OUTCOMES

- Improved grid automation and operational visibility
- Low latency, scalable communications
- Unified AMI and DA modernization
- Strong foundation for future grid innovation

SOLUTION

AVECC selected Itron Gen™5 Riva® meters paired with Itron Fiber Mini Access Point (Fiber MiniAP) technology to modernize its AMI system. The Fiber MiniAP was custom-designed by Itron for cooperative utilities to leverage existing broadband infrastructure. It combines direct connection to fiber with Itron's low-latency, proven Gen5 radio frequency (RF) communications network.

Fiber MiniAP: Enabling Low-Latency, Low-Hop Communications

The Fiber MiniAP plays a central role in AVECC's grid modernization strategy by:

- Extending fiber-based communications from the gigabit passive optical network (GPON) backbone to support AMI network take-out
- Supporting low-hop, low-latency communications for near real-time meter data
- Improved outage and restoration notification performance to enhance member relations
- Reduced network complexity with improved reliability and determinism
- Establishing a foundation for future grid edge appications and automation

This architecture allows AVECC to maximize the value of its fiber investment while avoiding the performance limitations associated with their legacy PLC systems.

BENEFITS

Collectively, these outcomes align with AVECC's broader business objectives to improve grid reliability, reduce outage duration, streamline operations and enhance the member experience—while preparing the grid for future demands.

Improved Power Quality, Reliability and Operational Visibility

Fiber-enabled communications provide AVECC with improved visibility into metering and downline DA assets, supporting faster fault detection, improved voltage management and more responsive outage operations.

Faster Detection and Response to Grid Events

By maintaining a low-hop, fiber-anchored architecture, AVECC achieves the performance required to detect and respond to grid events more quickly, without introducing unnecessary network complexity.

Reduced Program Risk and Improved Operational Efficiency

Coordinating AMI and DA modernization under a fiber-first strategy simplified planning, reduced deployment risk and minimized the operational burden of managing separate networks.

Future Ready Grid Foundation to Support Reliability and Member Needs

The Gen5 Riva meter platform and Fiber MiniAP architecture position AVECC to support future initiatives such as:

- Advanced grid monitoring and analytics
- More real-time data integration with AVECC's other upstream utility applications
- Grid edge intelligence applications

A Future-Ready Grid Foundation

By leveraging its existing fiber investment and adopting Itron's Fiber MiniAP and Gen5 Riva platform, Arkansas Valley Electric Cooperative is modernizing its grid with a scalable, low-latency communications foundation built for today's operational needs and tomorrow's innovations. This fiber-first approach enables AVECC to improve reliability, accelerate outage response and extend visibility across both AMI and distribution automation assets. The result is a more resilient, efficient and future-ready grid that supports member expectations while positioning AVECC for continued innovation as grid demands evolve.

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