

PROJECT PROFILE / AMEREN TELECOM UPGRADE PROJECT

BUILDING OUT A PRIVATE NETWORK ACROSS HUNDREDS OF SITES

When a Midwestern electric utility decided to build its own private fiber-optic network for telecommunications, it needed to reach beyond internal resources. Designing, installing and integrating with facilities across two states and approximately 450 sites would require many project efficiencies to be financially feasible.



USE OF GIS PLATFORM ENABLES NUMEROUS EFFICIENCIES

All stakeholders can collaborate efficiently through a comprehensive, multiuser environment.

PROJECT STATS

CLIENT Ameren

LOCATION Missouri and Illinois

ANTICIPATED COMPLETION 2023





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Ameren was placed into a difficult situation when the local public communication carriers announced they would no longer support the legacy communication lines that Ameren has relied on to support the operation of its electrical transmission and distribution businesses across its service territory.

With a lot of mission-critical substation equipment that uses legacy communications interfaces that don't interoperate with the service offerings provided by the public carriers, Ameren had to make a choice. It could replace and retrofit a lot of expensive devices, or it could build its own telecom system that would be capable of delivering the legacy communications interfaces required by its existing devices. The utility elected to build a private fiber-optic network to support its equipment. Using multiprotocol label switching (MPLS) technology would give it the flexibility to connect both newer and older equipment while expanding its telecom capabilities for more capacity and faster speeds.

Designing, procuring and implementing the private network solution that would reach approximately 450 sites across two states would be a tall order. While Ameren has a great team of telecommunications engineers, it needed a larger, project-focused team with technical experience in deploying MPLS for electric utilities. Ameren selected Burns & McDonnell to support the project on the strength of the company's practical experience with telecom technologies and long history of working in a utility environment.

Working alongside Ameren, we have led the detailed design and development of construction documents for the MPLS network engineering and system integration. With our support, the project began in 2015 and developed into a multiphase approach that is expected to achieve completion by the end of 2023.

While telecom technology vendors often offer engineering support, it tends to be based more on familiarity with residential installations, not mission-critical facilities like substations. In contrast, we have drawn on extensive engineering and construction experience at utility facilities to better inform planning and designs for the network installation. Our specialized knowledge means we understand higher requirements for redundancy and standby power, as well as how an installation could impact other equipment.

The project's ongoing success has been the result of realizing numerous efficiencies.



We were able to collect extensive site data in a single visit and input it into a geographic information system (GIS) platform, saving time and trips while building a central repository for detailed information beneficial to both this program and future projects. Putting all the information into that single platform also helped close any potential gaps and see that the design was fully contiguous even as it crossed the fence lines of each individual site.

With numerous internal stakeholders to satisfy, the GIS mapping helped obtain and expedite buy-in and approvals. Using collaborative tools in a multiuser environment enabled us to consolidate and deliver a lot of information. Having everything in the GIS database allowed all stakeholders to provide comments, check statuses, resolve conflicts and answer questions without waiting for manual distribution of documents and subsequent input from others. This facilitated faster resolution of any concerns or questions related to designs. It also cut back on the number of emails and meetings required to achieve agreements among several stakeholders.

Having all project scoping encoded in the GIS map also enabled us to put all decisions with cost inputs into the platform and group costs into scoping phases. The ability to see the extent of what was needed from a cost perspective accelerated cost certainty and allowed us to shave months off the schedule.

We delivered additional value and quality through a couple forward-thinking solutions:

> Using our in-house laboratories, we were able to stage equipment and allow Ameren to try out different technologies, testing and validating interoperability solutions while

selecting technologies and prior to procuring and deploying to the project sites.

 We are using a central facility to configure and test racks of equipment before they get shipped to the project sites.
We connect the racks and configure them in close quarters, establishing their functionality.
Once they are shipped to the sites and connected to the fiber network, we can focus on fiber concerns instead of equipment if there are any communication issues.

Because we are working on engineering, system integration and construction management aspects of the project, collaboration within our team has supported smoother handoffs for the utility, which improved communication, reduced installation issues and ultimately led to an early completion.



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