

CASE STUDY / **TRANSMISSION LINE EPC REBUILD**

UPGRADING SERVICE ON A TIGHT TIMELINE

When American Electric Power wanted to improve reliability and increase capacity near South Bend, Indiana, it needed fast work to acquire new right-of-way, rebuild the line and upgrade substations along the route, all while working around challenging outage schedules.



TRANSMISSION LINE REBUILD PROJECT BENEFITS FROM EPC EFFICIENCIES

Team develops customized methods and utilizes local approaches to stay on schedule.

PROJECT STATS

CLIENT

American Electric Power
(AEP)

LOCATION

Indiana

COMPLETION DATE

2019

14

**MILES OF NEW
AND UPGRADED
TRANSMISSION LINE**

270

**TUBULAR STEEL
MONOPOLES INSTALLED**

8

**WEEK WINDOW FOR QUINN
SUBSTATION REBUILD**

CHALLENGE

American Electric Power (AEP) needed to upgrade its 34.5-kV transmission line between the Jackson Road and Marshall substations to 69-kV to increase voltage efficiency and provide additional capacity, reliability and resiliency in the area around South Bend, Indiana. The effort would require rerouting portions of the transmission line, upgrading the aging structures and installing new conductor over the approximately 14-mile route.

Two substations along the route also required significant work. The Quinn substation in Lakeville, Indiana, would need to be rebuilt from 34.5/12-kV to 69/12-kV to support the line rebuild. And the outdated Lapaz substation would be decommissioned, demolished and replaced with a new Vintage substation nearby.

All of this work would need to be performed on a challenging schedule to accommodate AEP's electrical outage constraints.

SOLUTION

To maintain a single source of responsibility for the transmission line rebuild project, AEP selected Burns & McDonnell under an engineer-procure-construct (EPC) contract to provide complete permitting, right-of-way (ROW) acquisition, design, procurement and construction services.

The project team was responsible for negotiating and acquiring all ROW for the transmission line rebuild, creating a 60-foot-wide corridor for the project. Working in a five-month acquisition window to meet schedule needs, we prioritized the parcels according to the construction schedule, conducted an open house to identify potential landowner concerns, and negotiated easement agreements.

Aging wooden transmission line pole structures were replaced with 270 80-foot-tall steel monopole structures for greater power resilience. We also installed 64 new concrete pier foundations and 206 foundation culverts.

The Quinn substation rebuild was a unique challenge in that it needed to be completed during an eight-week outage window. The existing transformer was removed and the concrete oil containment





system was replaced. We installed a new transformer, regulators, switches and structures. On-site activities were coordinated so that the concrete removal subcontractor, transformer installer and testing subcontractors could all be on-site simultaneously.

Demolition of the Lapaz substation involved regulated material testing, removal and equipment salvage. This older substation was replaced with the new 69/13-kV Vintage substation, built on a 3-acre site. We designed and constructed the new structures, including protection and controls equipment and all associated transformer protection and distribution feeder relaying. Hitting key milestones on time and in accordance with the

utility's outage schedule was critical, because once the outages started, the system could not be re-energized until the Vintage substation was complete.

RESULT

The project was successfully completed on schedule, with the upgraded 69-kV transmission line and substations providing better reliability and greater capacity to St. Joseph and Marshall counties in northern Indiana.

The EPC delivery approach enabled several efficiencies in expediting the project work. Having a single source of responsibility streamlined efforts to maintain the aggressive project schedule.

For example, along the transmission line route, some soil conditions did not match previous soil borings, requiring longer structures and larger foundations. To maintain the strict timeline, we devised location-specific foundations that used materials readily available on-site. Additionally, given the brief eight-week window for the Quinn substation rebuild, the team devised lighting plans to extend the availability of working hours.

The land acquisition personnel developed an offer matrix, which matched parcel values against existing property values in the area. This facilitated the team's ROW acquisition on its expedited timeline.



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