

CASE STUDY / **VERA WIND INTERCONNECTION AND COULOMB SUBSTATION**

## STACKED TASKS HELP UTILITY MEET EXPEDITED TIMELINE

The wind of change is strong in Texas. Interconnecting wind power with the electrical grid is essential to deliver that renewable power to end users. To serve one new wind farm developer, Electric Transmission Texas needed to build a new transmission line and substation on a tight schedule.



# EARLY COLLABORATION WITH STAKEHOLDERS STREAMLINES SUCCESS

Forward-thinking processes deliver cost and schedule savings for routing, design and construction.

## PROJECT STATS

### CLIENT

Electric Transmission Texas (ETT)

### LOCATION

Knox County, Texas

### PROGRAM COMPLETION

April 2020

# 242.8

MW OF WIND POWER

# 3.9

MILES OF TRANSMISSION LINE

# 14

MONTHS FOR PROJECT COMPLETION

## CHALLENGE

Texas is a leading wind power-producing state, with more renewable generation being added regularly. One such generator was the new Vera Wind farm, owned by El Campo Wind, that would feature 67 wind turbines collectively generating up to 242.8 megawatts of clean energy.

Electric Transmission Texas (ETT) sought to interconnect the new farm to the grid. To do so, it needed to build a new 3.9-mile, 345-kV single-circuit transmission line extending from the Vera Wind substation to a new ETT-owned 345-kV Coulomb Substation, from which it would connect with transmission lines owned by ETT on the Electric Reliability Council of Texas (ERCOT) electrical grid.

ETT faced a tight schedule to select and secure a route, attain the necessary permits, and design and construct the 345-kV transmission line and substation so they would be ready when the wind farm was energized.

One additional late complication to the project was the necessity of completing construction work amid the first months of the COVID-19 pandemic while maintaining worker safety.

## SOLUTION

ETT selected Burns & McDonnell to provide full engineer-procure-construct (EPC) project delivery support, as well as permitting and commissioning, for the transmission line and the new Coulomb Substation.





Meeting the expedited timeline was the primary challenge. We were tasked with completing the Certificate of Convenience and Necessity (CCN) application filing, scoping design, procurement, permitting, acquisition support, construction and commissioning within a span of approximately 14 months.

Prior to kickoff, we conducted extensive site surveys to evaluate multiple potential routes, helping result in the selection of the optimal route in less than two months. Forward-thinking routing and permitting processes helped optimize cost and schedule throughout the life of the project. During the CCN filing process, the station layout and orientation were changed to minimize project costs without affecting the schedule. Time saved during the design phase helped mitigate later construction delays due to extended periods of poor weather and hindered site access.

Our EPC approach stacked normally linear schedules and tasks, allowing multiple activities to progress simultaneously. Within these efficiency gains, the scoping time frame was reduced from up to nine months to less than three months, while detailed engineering was shortened from one year to less than four months in spite of multiple layout changes during the scoping phase.

The 345-kV transmission line was constructed using optical ground wire (OPGW) and built as a single circuit, providing cost savings to ETT. Only a 0.7-mile section west out of the Coulomb Substation was built as double-circuit-capable. We also cut in one circuit of the existing 84-mile-long Edith Clarke to Clear Crossing double-circuit, 345-kV line into the substation. The greenfield substation was designed as a four-bay ring bus station, expandable to a breaker-and-a-half scheme for the addition of future lines. The site grading was redesigned to optimize costs, and the station breaker foundation was utilized for bus support to facilitate future expansion.

We selected regional subcontractors to help with the construction phase. Using local subcontractors also helped expedite the acquisition and delivery of materials to the remote location in north-central Texas.

Although the COVID-19 pandemic complicated many construction projects across the country during the final months of this project, construction and testing of the transmission line and substation were able to continue without stoppage during the first wave of the pandemic in March and April 2020 because of proactive health and wellness safeguards already on-site.

## RESULTS

Early and ongoing communication and collaboration with project stakeholders paid off in a cohesive design and early cost certainty, with only one change order requested by ETT over the seven months of the construction phase: a scope addition to add a substation perimeter fence. Our multidisciplinary team worked with subcontractors and ETT to receive design reviews and constructability input as design work progressed, allowing preliminary work plans to be developed. This also helped verify that key elements of the sequencing plan were carried through to procurement and construction.

Our integrated approach delivered schedule efficiencies that allowed the project to be energized ahead of schedule and within budget. There were no recordable safety incidents during 53,000 worker hours.

By successfully completing the transmission line and substation ahead of schedule, the Vera Wind farm was able to interconnect with the ERCOT grid as soon as it was energized. This resulted in revenue generation earlier than anticipated for ETT and El Campo Wind.



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