Substation
Relevant Experience

ENTRUST
SOLUTIONS GROUP

Dilkon Substation Project for Power Supply to New Hospital
Client: Navajo Tribal Utility Authority (NTUA)

Located in Dilkon, Arizona, the Dilkon Substation project addressed the pressing need to provide reliable power to a newly built hospital in the region. The project scope included the construction of a four-breaker 115kV ring bus, a 20 MVA power transformer, regulators, and a four-bay main and transfer distribution bus. Additionally, the installation of a control building, perimeter fence, mobile transformer bay, and new distribution switchgear were completed. Site grading and access road design were also integral aspects of the project.

The project faced the challenge of transitioning construction firms midway through execution, necessitating a high level of coordination among stakeholders. Despite this, ENTRUST successfully managed the transition and ensured the project stayed on track to reach completion.

ENTRUST provided critical construction support and engineering oversight to address the project's complexities. Key tasks included helping the replacement contractor understand both the original and updated design elements, resolving design-related ambiguities, and maintaining seamless communication to prevent delays. This ensured the project achieved its goals without compromising quality or deadlines.

Key Achievements:

- Maintained project momentum and successfully navigated the mid-project transition between construction firms.
- Supported NTUA with continuous engineering input throughout the design and construction phases.
- Delivered the project on time and within budget, meeting community and client needs.

The substation featured key components, such as regulators, a four-bay main and transfer distribution bus, circuit breakers, and advanced protections, ensuring reliability and operational efficiency. ENTRUST also mitigated challenges resulting from personnel changes by applying its extensive expertise and dynamic problem-solving approach. The Dilkon Substation was completed and energized as planned, ensuring reliable electricity supply for the new hospital. NTUA expressed satisfaction with ENTRUST's ability to address challenges and deliver the project within budget and on schedule. While the technical aspects of the project were conventional, the successful management of a mid-project construction firm replacement set it apart.

Kansas Wind Farm Substation Project for Renewable Energy Integration

Client: NextEra Energy Resources

Located in Kansas, the Kansas Wind Farm Substation project supported the generation and delivery of renewable wind energy. This initiative involved connecting a 253.8 MW wind farm to an "open air" collector substation equipped with two 34.5/345 kV main power transformers. The substation interlinks 90 GE 2.82 MW turbines to the Pioneer Creek Wind Farm 345 kV generation tie line. Although the construction of a 4.5-mile 345 kV transmission line to the point of interconnection (POI) was outside this scope of work, ensuring seamless integration with ITC's Spearville-Clark County 345 kV line was essential.

Throughout the course of the project, its scope underwent multiple changes due to unforeseen circumstances. Backup protection was a key concern, leading to the addition of a Battery Energy Storage System (BESS) for transformer protection. Furthermore, delays from the interconnection utility in designing and sourcing materials required proactive intervention. ENTRUST assisted with building the new interconnecting substation and sourcing breakers that fit within the scheme.

ENTRUST provided expert engineering and project management services while adapting to the project's evolving scope. Redesigning the transformer protection scheme to include a current limiting reactor (CLR), running interconnection and fault studies, and incorporating the BESS for enhanced protection were critical tasks completed by the ENTRUST team. Additionally, ENTRUST supported the utility with design and procuring materials to prevent further delays.

Key Achievements:

- Incorporated backup transformer protection by redesigning the protection scheme and adding a BESS.
- Facilitated the interconnection utility by building its substation and sourcing breakers, ensuring compatibility.
- Delivered the project on time and on budget, while aligning with client expectations.

The substation design included high-performance transformers, protection and control schemes optimized for renewable energy sources, and a seamless tie to the interconnection utility infrastructure. Throughout the project, ENTRUST maintained active communication between multiple stakeholders, ensuring alignment and efficiency despite the challenges.

The Kansas Wind Farm Substation was successfully completed on time, on budget, and to the satisfaction of NextEra and all involved parties. This was ENTRUST's first substation design project for NextEra, marking the beginning of a valuable partnership. Unlike typical brownfield substation designs, the Kansas Wind Farm Substation required collaboration with numerous stakeholders and precise communication to manage its complexities.

Lower Rio Collector Substation Project for 60MW Battery Energy Storage
Client: Ormat Technologies, Inc.

Located in Hidalgo County, Texas, the Lower Rio Collector Substation and 60 MW / 120 MWh Battery Energy Storage System (BESS) project addressed the challenges of building energy infrastructure on a tight timeline. The project included the construction of a 34.5 kV/138 kV collector substation with a 50 MVA transformer and utility-scale energy storage. Teams coordinated overlapping schedules, adapted to evolving ERCOT regulations, and managed vendor design updates during execution.

ENTRUST provided comprehensive engineering and project management services to handle the project's complexity. Key tasks included substation layout and design, grounding analysis, grading and drainage planning, medium-voltage cable routing, and Protection and Control (P&C) deliverables. The substation featured components such as a 34.5 kV/138 kV transformer with secondary oil containment, circuit breakers, metering units, and lightning protection through a static mast and overhead static wires. Midway through the project, vendor designs changed, requiring ENTRUST to make real-time updates to conduit layouts, foundation plans, and terminal connections while adhering to ERCOT rules and strict deadlines.

Key Achievements:

- Incorporated updated vendor drawings promptly to avoid construction delays.
- Established a three-way approval process to resolve issues between vendors, owners and engineers.
- Adjusted relay protection settings dynamically to meet ERCOT's evolving requirements.
- Responded to tax equity inquiries in time to meet DOE compliance.

The substation was completed and energized on schedule, successfully integrating all design elements. The BESS installation proceeded in phases, aligning with system configurations and operational needs. Throughout the project, ENTRUST managed shifting demands to deliver a safe, reliable and scalable grid system supporting renewable energy in South Texas.