

N|V|5

SUBSTATION DESIGN

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NV5 has significant experience in the design and commissioning of electrical substations. We have supported projects of various types and sizes ranging from large greenfield projects to single component replacements. NV5's experience in substation design complements the installation of utility-scale wind, solar, or energy storage projects.

NV5 has developed and designed substation projects nationwide with a variety of large utility partners and is comfortable working with a broad spectrum of utility standards. NV5 provides the physical, protection and control, relaying, and SCADA design services needed to interconnect large-scale renewable projects with the local electrical utility.

SERVICES

- Custom Steel and Foundation Design
- Constructability and Construction Phasing Assistance
- Ground Grid Design and Analysis Including Integration and Refurbishment
- Electrical Equipment General Arrangements, Plans, Sections and Elevations
- Shielding Design
- Bus Calculations
- Trench and Conduit Design
- Control Enclosure Equipment Layouts
- Commissioning Assistance
- Construction Support
- Third Party Review
- Substation Inspections and Documentation
- Cable Ampacity Studies
- Transmission Line
- Transformer Protection
- Motor Protection: Synchronous /Induction
- Distribution System Protection, Automation and Monitoring
- IEC-61850 Implementation
- Generator Protection
- Substation Bus Protection
- Breaker Failure
- Capacitor Protection
- Reactor Protection
- Relay Upgrades





BAKER JUNCTION SUBSTATION

BAKER, MT | MONTANA-DAKOTA UTILITIES CO.

Montana-Dakota Electric (MDU) is expanding the 115 kV/60 kV yards at the Baker Junction Substation. This project includes the installation of a new 50/66/93MVA 115/60kV LTC transformer to parallel the existing transformer. The existing 115 kV had a ring bus configuration with room to expand and the 60 kV required two bay additions to the existing main/transfer bus system.

The detailed design portion of this project involved the physical, structural fabrication, civil, environmental, and electrical engineering design, and calculations. Scope of services also included equipment procurement support, construction contract support, supervision and technical support during construction. NV5 was responsible for all physical procurement and construction coordination.

NV5 developed all project specifications for equipment and construction, estimated construction costs and issued bid packages for construction services and equipment, as well as procuring and executing construction contracts. Construction Supervision by NV5 personnel oversees and coordinates all the construction activities required for the completion of the project.

PROJECT SIZE: 115 KV/60 KV

VALUE OF CONSULTANT SERVICES: \$278,460

YEAR COMPLETED: 2016

SERVICES



Physical Engineering Design



Civil Engineering Design



Electrical Engineering Design



Structural Fabrication



Environmental