

Other Relevant Experience

260MW Solar PV/BESS Project, Pershing County, Nevada

Client: Confidential

Location: Nevada

The project, located in Pershing County at Oreana Station, Nevada, involved a 260MW Solar PV/Battery Energy Storage System (BESS) interconnection study.

The objective of the study was to identify and mitigate potential voltage and overload issues within the system, ensuring planning criteria were met prior to project implementation.

Scope of Work

The study assessed system impacts at various stages of development, conducting contingency analyses for Area N-1 outages across four scenarios:

- Scenario 1: Excludes lower queued generation and new loads.
- Scenario 2: Adds back new load (28MW Gold Rush and 55MW from Winnemucca Substation).
- Scenario 3: Includes lower queued generation projects with Transmission Service Rights (TSRs).
- Scenario 4: Integrates the Project.

Key Challenges

The original case had to be modified to account for load fluctuations and previously queued generation projects omitted initially. This ensured the study accurately attributed required upgrades specifically to the project.

Solutions Delivered

The team addressed these challenges with a detailed comparative analysis of voltage and overload violations across all scenarios. Specific solutions included:

- Voltage Mitigation: A discrete incremental shunt capacitor model was used to address undervoltage issues for the prescribed N-1 contingencies.
- Overload Analysis: Mapped miles of circuits subjected to various overload levels, identifying reconductoring needs for 120kV and 63kV circuits under each scenario.

The study provided actionable insights on system impacts, including the magnitude of required upgrades and cost allocation among stakeholders. Graphical summaries and comparative tables clarified analysis results, enabling clear decision-making. Findings supported effective mitigation of system violations, ensuring compliance with planning criteria.

ENTRUST:

- Delivered cost-efficient solutions without compromising performance.
- Maintained consistent communication and responsiveness throughout the project lifecycle.
- Leveraged technical acumen to address complex challenges, exceeding expectations.

Advanced Metering Infrastructure Deployment for Cheyenne Light, Fuel and Power Company (CLFP)

Client: Cheyenne Light, Fuel and Power Company (CLFP)

Location: Wyoming

CLFP, a subsidiary of Black Hills Corporation, implemented an advanced metering infrastructure (AMI) system, a meter data management system (MDMS), a customer web portal, and an outage management system (OMS). This initiative was part of a broader effort by Black Hills Corporation to modernize its electric distribution systems across its subsidiaries, enhancing operational efficiency and customer service capabilities.

The project aimed to expand existing smart grid functionality to provide customers with new options for energy management, improve reliability, and streamline system operations. Specifically, the AMI system introduced functionality to support time-based rate programs for managing peak loads, reduce operating costs, and improve outage restoration through integration with OMS.

Deployed Technologies

- **Communications Infrastructure:** A radio frequency (RF) mesh network was deployed to connect smart meters to strategically placed data collectors, transmitting data to CLFP's back office systems. This two-way communication infrastructure enhances operational capabilities and enables future service upgrades.
- **Advanced Metering Infrastructure:** 39,102 smart meters and 62 data collectors were installed, offering features like remote tamper detection, outage and restoration notifications, and remote service connect/disconnect capabilities. A web portal provides customers with validated usage data and energy management tools.
- **Meter Data Management System (MDMS):** The MDMS validates, analyzes, and processes data for billing while enabling the development of innovative programs, such as time-of-use rates, and supports reliability planning and power quality improvement.

Key Achievements

- **Reduced Operating Costs:** Automating meter reading and customer service activities lowered operational expenses significantly.
- **Enhanced Outage Management:** Faster outage detection and restoration were achieved through meter pinging and OMS integration, enabling efficient crew dispatch without the need for customer calls.
- **Fuel Savings:** The AMI system reduced field crew dispatches for tasks like service turn-offs, achieving up to a 90% reduction in truck rolls for customer orders.

- Improved Customer Experience: Customers now benefit from accurate billing, reduced reliance on estimated bills, and access to detailed consumption data, providing greater transparency and control over their energy use.
- Establishing a dedicated test environment is critical for validating software updates, system upgrades, and data transfers.
- Adapters are required for communication between MDMS and AMI systems when sourced from different vendors, necessitating extensive system and integration testing.
- Over-the-air firmware upgrades for meters significantly reduce costs and eliminate the need for on-site visits.

CLFP plans to leverage the AMI system to explore time-of-use rates and demand response programs to manage peak loads more effectively. Additionally, the system will enable further automation of distribution technologies to enhance operational efficiency.



Puget Sound Energy (PSE)

ENTRUST has supported PSE as an Owner's Engineer, providing protective relay settings and engineering support during peak workloads. Services include modeling, relay coordination, and settings for SEL relays (651RA, 351S, 751/751A, 487E, 387) across 12kV reclosers, feeder breakers, transformers, and DA schemes. ENTRUST also delivered arc flash fault current studies, construction-phase engineering support, and high-quality design packages compliant with industry codes and PSE's standards. Projects range from simple installations to complex substation rebuilds with SCADA and capacity upgrades.

Juwi, Inc.

ENTRUST developed protection and control settings for the Spanish Peaks 230/34.5kV solar PV substation to integrate a utility-scale solar plant. Key tasks included SEL relay settings (411L, 311L, 487E, 787-3E, 2533, 2414) for line differential, transformer protection, and annunciation. ENTRUST updated the utility's ASPEN model, analyzed inverter short-circuit contributions, and completed relay coordination while ensuring compliance with NERC PRC-025-2 and PRC-027-1. Deliverables included .rdb files, ASPEN models, settings narratives, and stakeholder communication support.

STEC – Sioux Substation

ENTRUST provided protection and control design for Battery Energy Storage System (BESS) integration into the 138kV transmission system. Services included relay settings for SEL relays (411L, 311L, 487B, 387), coordination studies, PRC-027 compliance, and AC/DC schematics. ENTRUST also developed bid documents for procurement and ensured all deliverables followed STEC's standards. Outputs underwent rigorous QA/QC and included wiring drawings and cable schedules.

Automation, Communication, and SCADA

ENTRUST specializes in SCADA/RTU settings, DER/BESS studies, and power quality solutions. Services include system architecture design, RTU platform configurations, HMI development, device configuration, and communications design for secure and reliable data flow. ENTRUST prepares detailed deliverables, such as site one-line diagrams, microgrid master plans, isolation equipment recommendations, and conceptual SLDs for PV and BESS projects.

Key Deliverables:

- Point lists and RTU mappings
- System architecture and communication designs
- HMI applications and device configurations
- Microgrid layouts, operational requirements, and critical load modeling reports

Testing and Support

ENTRUST offers testing and commissioning support, including field oversight, test plan creation, and protection database updates. Testing ensures settings accuracy and alignment with design intentions. ENTRUST provides validation, documentation updates, and coordination with clients to finalize settings databases like ASPEN.

Key Deliverables:

- Testing plans
- Updated relay databases
- Commissioning forms

Compliance and Cybersecurity

ENTRUST supports NERC CIP compliance through C2M2 methodologies, risk assessments, and infrastructure improvement recommendations. Deliverables include CIP audit procedures, training modules, and compliance reports. ENTRUST has upgraded control systems for utilities, addressing cybersecurity and physical security requirements.

Project Management

ENTRUST's project management team ensures schedule and budget alignment, QA/QC oversight, and procurement support. Project managers maintain detailed schedules, monitor resources, and coordinate client interactions for smooth execution.

Key Deliverables:

- Project schedules
- Status reports
- RFI/RFP management documents

Automation Tools

ENTRUST employs ASPEN OneLiner, AcSELeator QuickSet, and other platforms for efficient protection studies and settings development. Key capabilities include system-wide coordination checks, relay setting calculations, TCC plotting, and compliance with standards like PRC-027.

ENTRUST's comprehensive expertise in protective relays, SCADA, automation, and compliance makes it a trusted partner across diverse utility projects.

