

Powering Growth: How IEA Delivered 11.4 MW of Standby Generation for a Major Iowa Processing Plant

Summary

Over a 10-year period, IEA Power engineered, built, and expanded an 11.4 MW diesel-fired standby power generation facility for a major processing plant in central Iowa. Designed to evolve with the customer's growing energy demands, the system ensures reliable backup power, advanced control, and seamless integration with utility operations.

The Challenge

The client's facility experienced continuous load growth and evolving infrastructure requirements over a 10-year span. IEA needed to design and implement a modular standby generation system that:

- Expanded alongside customer production needs.
- Maintained operational reliability across multiple utility feeds.
- Integrated smoothly with evolving site electrical infrastructure.
- Provided flexible control modes for varying operational demands.

In 2019, a major change occurred when the utility supplier relocated its substation, eliminating three utility feeders and six customer load ties, requiring a full redesign of system interconnection and control.

The Solution

IEA Power designed and built a diesel-fired standby generation plant in three phases to align with the customer's growth trajectory:

1. Phase 1: Installed three 1.6 MW generators, a single utility feed, and two customer load ties.
2. Phase 2: Added two more 1.6 MW generators, a second utility connection, and two additional load
3. Phase 3: Completed the system with one 1.6 MW and one 1.8 MW generator, another utility feed, and two more load ties.

When the utility substation was relocated in 2019, IEA reconfigured the system to operate from a single utility feeder and generator tie, ensuring full operational resilience and compliance with new infrastructure conditions.

The completed system includes:

- Seven walk-around enclosure diesel generators providing 11.4 MW total capacity
- One 12,000-gallon above-ground fuel tank with 100-gallon day tanks at each enclosure
- Seven 4.16 kV switchgear sections, each with a generator circuit breaker and Woodward EasYgen controls
- One tie circuit breaker linking the generator bus to the utility
- A Master PLC cabinet for centralized control
Rockwell RSView SE HMI software for remote monitoring and control
- A 15" Allen-Bradley PanelView color touchscreen for operator interface

The generators produce power at 4,160 volts, tied to a common emergency bus and through a tie breaker to an IEA-owned 12/16/20 MVA transformer, stepping up voltage to 24.9 kV. The transformer connects to S&C Vista distribution switchgear and the utility via an automatic recloser.

Result & Impact

- 11.4 MW of reliable standby power supporting continuous industrial operations.
- Scalable system design that grew with facility load over 10 years.
- Seamless transition after utility substation relocation with zero downtime.
- Advanced control and automation, enhancing operational efficiency and resilience.

Safe and compliant fuel delivery system with minimal operational disruption.

Long-term resilience in a compact and complex urban setting.