

PetroChem Plant Realizes Nine-Month ROI through CHESS Solutions

Project Type:

Electrical system survey, turnkey power factor correction, and active harmonic filter installation.

Abstract:

By providing a sound foundation of analytical studies and complete turnkey installation, Eaton Corporation's Cutler-Hammer Engineering Services and Systems (CHESS) helped a major petrochemical plant optimize its power factor and reduce electric utility bills, resulting in a nine-month payback.

The Customer:

A large, petrochemical (polypropylene) plant.

Project Scope:

While CHESS had an ongoing relationship with this polypropylene plant, the plant management were reluctant to make the necessary commitment required to correct the electrical system. Fortunately a new plant engineer was hired and he eventually confirmed what CHESS had been suggesting all along – the plant's electrical system needed to be properly analyzed to find a long-term solution for the serious problems that existed.

The plant's new electrical engineer contacted CHESS for a total solution approach. It started with a complete survey of the electrical system, including load monitoring followed by a comprehensive array of analytical studies.

An Integrated Project Solution:

Once the analytical study results were available, CHESS power system engineers were able to calculate the appropriate size for capacitor banks and determine whether or not tuned filters were necessary. Due to the multiple operating configurations, this plant's electrical power system was not a candidate for conventional tuned filters. Fortunately, new technology in the form of active harmonic control was available. CHESS integrated this equipment along with conventional fixed and switched capacitor banks, project management, technical direction, coordination of the electrical contractor and all other project responsibilities. This integrated project solution removed the burden of this major project from the customer's day-to-day activities, and differentiated CHESS from competitors.

An Unexpected Discovery:

In the course of surveying the electrical system, inconsistencies were found between the original design drawings and the latest as-built documentation. Although the original one-line diagram indicated that the power transformers were delta-wye grounded, in actuality they were ungrounded. Immediately following this discovery, CHESS engineers explained the many benefits of medium-

voltage, high-resistance grounding, especially for systems requiring critical uptime. This revelation and the insight that CHESSE engineers had into this system impressed the customer. They proceeded in ordering three medium-voltage, high-resistance grounding (HRG) packages; designed, built and installed by CHESSE.



Turnkey Solution:

CHESSE provided all of the following services to this polypropylene plant:

Power Systems Engineering

- Short Circuit Analysis
- Protective Device Coordination
- Load-Flow Analysis
- Harmonic Analysis
- Power System Grounding Evaluation

Field Services

- Power System Data Gathering
- Protective Relay Testing

Turnkey Project Capabilities

- High-Resistance Grounding Installation
- Capacitor Bank Installation
- Active Harmonic Filter Installation
- Equipment Start-up and Commissioning

Conclusion:

The petrochem plant has decreased its electrical billing demand by a substantial amount, resulting in a project payback of nine months. This bottom-line benefit combined with other advantages, such as released transformer capacity and reduced levels of system harmonics, resulted in higher system reliability and less downtime.

How Can CHESSE Help You?

Your facility may benefit from turnkey power factor correction, and active harmonic filter installation. CHESSE also provides a full complement of other services, including:

- **Asset Optimization:** Outsource the responsibility for your electrical distribution system and associated equipment to CHESSE. Offerings involve shared cost savings and performance guarantees for greater focus on your core business.
- **Knowledge Management:** Collect and transform your system data to useful knowledge, allow for proactive planning, energy management, optimized decision making, failure prediction and ultimately, cost savings.
- **Integrated Project Solutions:** Procurement, installation and commissioning of power systems equipment; a total turnkey approach.
- **Power Systems Engineering Solutions:** Power systems automation, design engineering, training, predictive diagnostics and power systems studies/analysis to decrease costs and increase productivity.
- **Power Systems Modernization:** Keep your system operating at peak efficiency, reliability, and safety through equipment life extension and upgrade solutions utilizing new technologies.
- **New Equipment Services:** Installation, testing, and commissioning of virtually any electrical equipment.
- **Field Services:** Power system and equipment service, maintenance programs, testing, upgrades, and Aftermarket solutions; 24/7 emergency service; crisis response.

Call 800.498.2678 and ask for the office nearest you to learn more.



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