**Markets Served** Utility/Industrial

# Turnkey Solutions

Installation of a modern, Eaton system offers improved system service, plant availability and plant operating costs. Eaton's turnkey approach enhances the protection of generators and turbines — saving millions of dollars.

| CASE STUDY | |
|---|---|
| Loss of revenue | $100,000 |
| Customer claims | $3,200,000 |
| Litigation | $1,000,000 |
| Miscellaneous | $500,000 |
| **Total Losses** | **$4,800,000** |
| Simple Payback Period | 12 months |

Electrical utility companies and large industrials that operate synchronous generators and motors with old-style rotating exciters spend hundreds of thousands of dollars on maintenance each year.

It's basically a chain reaction – if one goes, then they all go. The loss of revenue and extensive damage of other units are worth millions of dollars.

Installation of a modern, Eaton system offers improved system service, plant availability and plant operating costs. Eaton's turnkey approach enhances the protection of generators and turbines - saving millions of dollars. We also offer turnkey solutions for any electrical PowerChain Management application regardless of its size or scope.

## The Program

Standard less than 1.5% peak to peak of DC output voltage with battery. Extra filtering to customer load requirements are available.

- Comprehensive power system studies
- Turnkey installation of new static exciter
- Start-up and commissioning
- Long-term maintenance
- 24/7/365 support

The combined value of these services was $3.3 million.

Because of the system modifications and new static exciters, the generators are now like new and can respond rapidly to system power swings and other transients. This project continues to provide substantial cost savings and will pay for itself after the next system swing.

- Enhanced Safety
- Greater Reliability
- Operating Cost Efficiencies
- Effective Use of Capital
- Risk Mitigation
- An Eaton Green Solution

EATON
*Powering Business Worldwide*

To learn more, contact: Eaton Corporation www.eaton.com/electrical.

In an effort to restore power, alternate power feeders were energized.

## ROI Calculation

The ROI is dependent on generating capacity, the average price of generated power, the avoidance of maintenance costs and improvements in system reliability. For a station of 400 MW capacity and an average price of $.09 per kWh, each hour has a value of $32,000 per hour in lost revenue. Rotating exciter maintenance can easily cost $20,000 – $30,000 per year.

## Costs Associated with an Electrical Power Outage

- **Production Losses:** Losses associated with stopping all plant production, the financial effects at downstream facilities, scheduling problems, and delays in delivering products to end customers.
- **Labor Costs:** Disposal of waste product, replacement product manufacturing, start-up costs and special clean-up procedures.
- **Equipment Costs:** Repair, maintenance or replacement of damaged equipment.
- **Data Recovery Costs:** Costs associated with reprogramming, computer reconfiguration, data recovery, corrupted data.
- **Additional Factors:** Loss of sales, excess inventory, quality control, depreciation, work-in-process charges.

## Results

An electric utility company serving a major northeast metropolitan area experienced a major fire and explosion. This incident severed more than half of the power feeders into the city center. In an effort to restore power, alternate power feeders were energized. However, due to slow response of the older excitation system, the generators rejected the load, resulting in a sustained power outage.

| LOSSES INCLUDE: | |
|---|---|
| Loss of revenue | $100,000 |
| Customer claims | $3,200,000 |
| Litigation | $1,000,000 |
| Miscellaneous | $500,000 |
| **Total Losses** | **$4,800,000** |

## The Value of PowerChain Management

PowerChain Management helps enterprises achieve a competitive advantage through proactive management of the power system as a strategic, integrated asset throughout its lifecycle. PowerChain Management ensures that organizations will experience whole system reliability from end to end.

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Printed in USA
Publication No. SA02721003E
January 2013

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