



The California Energy Commission and the U.S. Department of Energy, Office of Industrial Technologies BestPractices present:

# ENERGY SOLUTIONS FOR CALIFORNIA INDUSTRY:

## WAYS TO IMPROVE OPERATIONS AND PROFITABILITY

JANUARY 2002

CASE STUDY

### BENEFITS

- Saves \$32,000 in annual energy costs
- Saves 400,000 kWh annually
- Improves equipment life
- Increases efficiency

### APPLICATIONS

Many corporate headquarters and other buildings have decorative fountains. Large pumps are used to circulate water in these systems. Being able to automatically control these pumps remotely can save both energy and manpower

### ABOUT THIS EVENT

The purpose of the Energy Solutions for California events is to provide a *professional, solutions-oriented* environment for industrial electricity users who face serious challenges to remaining operational and profitable during the current energy crisis. Industrial electricity users have the opportunity to receive unbiased information and analytical tools that can increase reliability and manage short and long-term production costs.

## Pump System Controls Upgrade Saves Energy at a Network Equipment Manufacturing Company's Corporate Campus

### Summary

In 2000, Cisco Systems upgraded the controls of the pumps that circulate water through the fountains in front of the buildings at its headquarters in San Jose, California. In response to rising energy costs, Cisco Systems decided to turn the fountains off during peak hours. Since many pumps serve the fountain systems that are hard to access, Cisco installed a wireless control system that was able to control all pumps simultaneously from one location. The project resulted in annual energy savings of \$32,000 and 400,000 kWh, which represents savings of 61.5% of the fountain pumps' total energy consumption. With a total cost of \$29,000, the simple payback was 11 months. The project also reduced maintenance costs and increased the pumping systems' equipment life.



One of the Fountains at Cisco System's Headquarters



## Company/Plant Background

Cisco Systems, Inc. manufactures networking equipment and services for the Internet. Founded in 1984, Cisco has pioneered and advanced the development of Internet Protocol (IP) - the basic language to communicate over the Internet and in private networks - based networking solutions for many corporate, education, and government networks around the world. Cisco IP network solutions include technologies such as routing and switching, voice and video over IP, optical networking, wireless, storage networking, security, broadband, and content networking. These technologies allow for fast and reliable transport of data, voice and video information within buildings, across campuses, and around the world.

The Cisco Systems' headquarters in San Jose, California, is a corporate campus facility with many separate buildings. Nineteen buildings, each having fountains at their entrance, were selected for this project. The pumps serving each fountain vary in size from 1 to 20-hp.

## Project Overview

Prior to the project's implementation, the pumps that served the fountains were each controlled manually. During peak load periods, the company wanted to shut the fountains off to reduce energy costs. Doing this required several technicians to go to each pit that housed the pump system, open a heavy iron door and physically climb into the pit to shut off the pump. This process took at least 45 minutes. When the company wanted to turn the fountains back on, the process had to be repeated as each pump was manually restarted. In order to make the process of deactivating and restarting the pumps as efficient as possible, Cisco sought a solution that would allow headquarters staff to start and stop all fountains simultaneously without having to enter the pits.

## Project Implementation

After researching several options, Cisco' Energy Team identified a remote, wireless control system as an appropriate solution. The wireless control system presented Cisco with several advantages. The first benefit was that the pumps could be shut on and off remotely, which averted the need for the technicians to enter and exit the pits. A second benefit was that the control package Cisco installed was sophisticated enough to shut off the pumps simultaneously from one location. Finally, the controls package was very small and required minimal space and energy to operate.

### Project Results

The wireless control system installation greatly improved Cisco's ability to modulate the pumps serving their fountains. This resulted in important energy savings and more efficient operation of the fountains' pumping systems. In addition Cisco's Energy Team programmed the building controls in all building to curtail load from HVAC and lighting systems to reduce energy demand. Cisco is now able to curtail its electric load for each of the 19 buildings that have pumps in less than 30 minutes because it can shut off its pumps more rapidly. Previously, it took up to one hour for the load on those 19 building to be curtailed when the pumps had to be shut off manually. The annual energy savings from the project total 400,000 kWh and \$32,000. Since the project's cost was \$29,000, Cisco achieved a simple payback of only 11 months. In addition, the project allowed for reduced maintenance needs since the pumps didn't need to be serviced as often and the technicians who used to enter the pits were able to focus on other tasks.



The Remote Wireless Control System

## Lessons Learned

A proper control strategy is essential for energy efficiency. Convolved or obsolete control systems can lead to energy waste and high maintenance and labor costs. Evaluating a system's control strategy and equipment helps to determine the most technologically appropriate and cost-effective control system that saves energy while maintaining performance or production levels. In the case of Cisco Systems' fountain pumps, a wireless control system that allowed it to shut its fountains on and off more rapidly was sophisticated enough to accomplish the goal the company wanted to achieve. By implementing this project, Cisco Systems has been able to reduce energy and maintenance costs effectively.

### United States Department of Energy's Office of Industrial Technologies BestPractices

BestPractices is part of the OIT's Industries of the Future strategy, which helps the country's most energy-intensive industries improve their competitiveness. BestPractices brings together the best-available and emerging technologies and practices to help companies begin improving energy efficiency, environmental performance, and productivity right now.

### California Energy Commission

The California Energy Commission is the state's primary energy policy and planning agency. It is the California Energy Commission's mission to assess, advocate, and act through public/private partnerships to improve energy systems that promote a strong economy and a healthy environment.



California Energy Commission  
and U.S. Department of Energy  
present

### ENERGY SOLUTIONS FOR CALIFORNIA INDUSTRY

Ways to Improve  
Operations and  
Profitability

## PROJECT PARTNERS

- Cisco Systems, Inc.  
San Jose, CA
- California Energy  
Commission  
Sacramento, CA
- Telemetric Corporation  
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