

Case Study: California Data Center Data Center Air Flow Management Cold Aisle Containment



Company and Data Center Background

Reducing greenhouse gas emissions and utilizing new, energy-saving practices are principal objectives for The Company. In 2008, the company examined its Production Data Center energy usage to determine the energy savings potential of implementing airflow best practices. The company determined it was providing significantly more cooling than needed by comparing the amount of cooling being supplied to the amount required by the IT load.



Appeal of Cold Aisle Containment

The company sought to achieve rapid efficiency gains with the least disruption to the site operations and with minimal demand on its facilities staff. Cold Aisle Containment along with a subsequent, simple tuning of the cooling system met those objectives. Further, containing the cold aisle offered improved reliability by providing a more uniform server inlet supply temperature.

Annual Energy Savings	\$30,000
Energy Savings	306,600 kWh
Implementation Costs	\$18,700
PG&E Rebate	\$9,350
Payback	3.7 Months

Data Center At-a-Glance

- 1,600 square feet
- 335kW IT Load
- One 90 ton roof air handling unit and 3 floor CRACs at 30 tons each
- Economizer integrated with roof unit

Project Drivers

- Increase data center efficiency
- Improve air management
- Meet corporate goals to reduce greenhouse gas emissions
- Achieve savings with little or no impact on current operations

Recommended Solutions

- Deploy cold aisle containment
- Blank off empty rack units
- Seal floor penetrations with Air Dam Foam
- Raise CRAC and AHU sets points

Cold Aisle Containment Solution

The containment solution included:

1. Isolation of the cold aisles using PolarPlex™ Containment Panels.
2. Blanking sheets to block off empty rack units.
3. PolarDAM Air Dam Foam to block recirculation under the racks and to seal gaps between rack sides and mounting rails.



Tuning of Cooling System

After the cold aisle containment installation, the CRAC unit and AHU set points were gradually raised from 73°F to 85°F. During this process, the BMS alarm set points were also reset. Through the process, the entire cooling load was moved to the roof AHU and two of the CRAC units ran the fans only as a sort of standby and one of the CRAC units was taken completely offline.

PG&E Incentive

The company applied for the PG&E incentive program. PG&E visited the site for a pre-audit to establish a consumption baseline from which the incentive would be based. Temperature monitors were placed on the CRAC units for a period of one week to establish the baseline. After the installation, a second week of monitoring was conducted to assess the new energy usage rate. PG&E used the monitoring results to determine that the company reduced its energy consumption by 306,600 kWh annually and used that to award a \$9,350 incentive.

Results

PG&E validated an energy savings of \$30,000 annually. Also, the variation in server supply temperatures was reduced from 20°F to 6°F.

Compelling ROI

- Payback less than a year
- Turned off CRAC units
- Reduced hot air recirculation
- Increase CRAC set points
- Increased the amount of economizer usage time
- Offset the project costs with PG&E incentive

The Company

The company in this case study is a large entertainment company headquartered in California. Its data center is located in Northern California.

About Polargy

Polargy is an energy efficiency company that provides airflow management solutions for mission critical data centers. Polargy's product portfolio includes PolarPlex™ Containment Systems, PolarRack™ server cabinets, and consulting services. Polargy's emphasis on cooling performance helps data center operators and facilities managers achieve energy efficiency gains and extend the life of their data centers.