Case Study | The Hanover Insurance Group

Electronic Environments assists The Hanover Insurance Group with Data Center Energy Savings and IT Cooling Capacity

QUICK FACTS

Company: The Hanover Insurance Group, Inc.

Location: Headquartered in Worcester, MA

SUMMARY OF PROJECT

Cost of project: $144,000.00

Estimated annual savings: 600,000 kWh

Estimated energy cost savings: $96,000.00/yr

Utility incentive: $21,500.00

Company payback: 16 months (with rebate)

BENEFITS

- Five out of 13 CRAC units were placed into hot-standby, and energy usage for cooling reduced by 27%
- Increased cooling redundancy
- Increased IT load capacity by 70kW
- IT equipment is thermally safe
- 24x7 monitoring
- Energy incentive from the National Grid Commerical Energy Efficiency Program

PROJECT SUMMARY

IN TODAY's intensely cost-conscious, hi-tech business world, growing numbers of America's companies are looking to save money and improve energy consumption at the same time.

Most recently one of those companies was The Hanover Insurance Group, via their collaboration with Massachusetts-headquartered EEC (Electronic Environments Corporation).

The Hanover was looking to improve their data center's cooling efficiency, as well as the current system's capacity – while allowing for increased IT (Information Technology) equipment densities within their data center. A strong proponent for reductions of energy and greenhouse-gas emissions, The Hanover continues working with National Grid to accomplish this… earning them the EPA's Energy Star certification in recognition of superior energy efficiency and environmental protection.

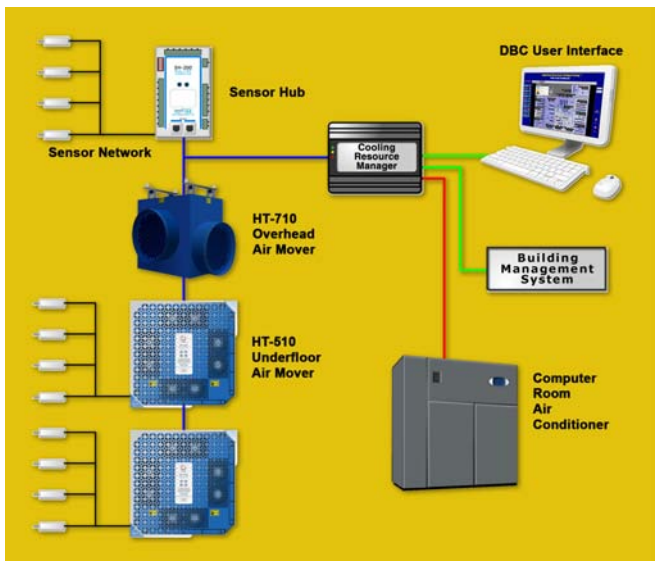
As a result, many energy efficiency practices have already been put into place, including implementing a high-efficiency ultrasonic humidification system (recommended and installed by EEC, who is also responsible for maintaining the data center's power and cooling infrastructure).

But The Hanover was still seeking to find additional data center energy savings.

The Hanover was moving from classroom-style server to a hot aisle/cold aisle setup. Their aim was to increase the density in their racks, which would create issues with air distribution, causing hot spots at the rack level.

Electronic Environments, working closely with The Hanover, recommended a unique solution that could not only save energy and eliminate hot spots, but also maximize IT cooling capacity in the data center.

Enter….**the Demand Based Cooling™ (DBC) airflow and thermal management system from AdaptivCool®.** Customizable, this system consists of a series of networked HotSpotr™ underfloor and overhead air movers, server rack and Computer Room Air Conditioner (CRAC) temperature sensors, sensor hubs, CRAC controllers, and Environmental Management Software.



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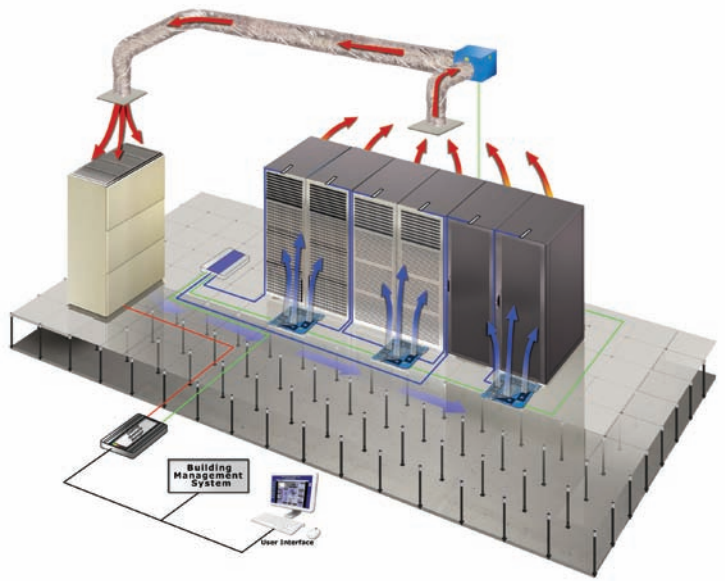
Electronic Environments Infrastructure Solutions

Now, here is the breakdown of how it all -- beneficially -- came together:-

THE PROJECT:

The project involved a 13,000 ft² data center comprised of three rooms cooled by 13 CRAC units. Comparing the IT load to available cooling capacity in each room, Electronic Environments discovered the center to be 50% overcooled. Utilizing the Demand Based Cooling system would enable the The Hanover to put some CRAC units into hot standby (i.e. Off, but available if needed in the event of a unit failure). Yet enough cooling would still be available to keep the server racks within the 2008 ASHRAE (the international technical society organized to advance the arts and sciences of heating, ventilation, air-conditioning and refrigeration) guidelines --between 64° / 80.6°, and above a 41.9° corresponding dew point.



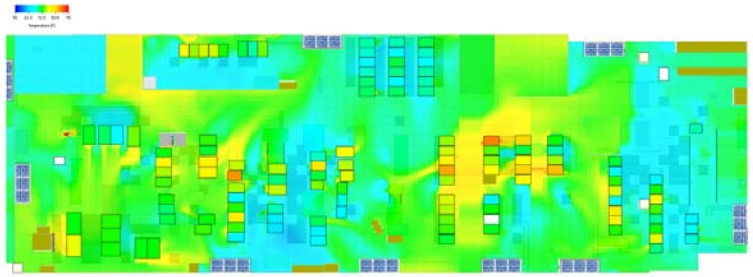
THE CHALLENGE:

- Integrate new energy-efficiency technology within the data center, without affecting day-to-day operations
- Eliminate all the data center's hot spots
- Achieve all this without making major changes to the existing data center infrastructure
- Meet the Company's less-than-24-months economic payback criteria

THE SOLUTION:

Information from an initial on-site audit was used to build a Computational Fluid Dynamics (CFD) model of the data center, which simulated airflow and thermal characteristics of its rooms. CFD modeling and analysis results were then used to develop a customized airflow and thermal solution, outlining the baseline conditions of the data center (including energy consumption and cooling capacity), as well as defining the customized DBC system to be installed.

System installation – Along with the customized DBC airflow and thermal management system to ensure the rooms' integrity, Electronic Environments also installed cut-out covers into floor openings, and blanking panels into key rack openings. Adjustments were also made to some CRAC set points.



Showing airflow, temperature and static pressure throughout the data center, the above CFD model allows for proper placement of both HotSpotr underfloor air-movers to get cool air directly to racks that needed it, plus overhead air-movers to bring hot air directly back to the live CRAC units. **After installation, five (5) of the 13 CRAC units were able to be put into hot standby.** With these units off and proper heat returning to the operating CRAC units, energy usage for cooling was reduced by 27%. This saving also increased the room's cooling redundancy by having an additional five CRAC units of excess capacity.

ADDITIONAL BENEFITS TO THE HANOVER :

- During system installation, the Company increased its data center IT load capacity by 70 kW.
- The 24 x 7 monitoring allows for automated CRAC unit response. In the event of a thermal occurrence in the data center, the system signals those units in hot standby to automatically start up for additional underfloor air pressure and cooling. Simultaneously, the system can generate related email alerts to inform the customer. Once the occurrence is corrected, the units automatically go back into hot standby.
- An energy incentive from the National Grid Commercial Energy Efficiency Program for installing the DBC system.

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