FLUKE®

"I can go up to my administration and say 'I saved you $100,000 last year in energy.That's the equivalent of you having to go out and look for $2 million dollars worth of new business.' It gets their attention."

York Chan, Facilities Director

Century-old hospital hums with 21st-century efficiency

Case Study

Energy Waste

AT A GLANCE:

SITUATION

- Advocate Health Care
- Healthcare
- Chicago, IL
- York Chan, Facilities Director

CHALLENGE

Managing air quality, energy consumption and energy conservation

SOLUTION

Delivers energy savings using state-of the-art technology

TOOLS USED

- 179 DMM
- 62 IR Thermometer
- 1735 Three-Phase Power Logger

RESULTS

- The facility now uses 27 percent less energy than the average U.S. hospital
- ENERGY STAR recognition in 2008

Based in Oak Brook, IL, Advocate Health Care is recognized as one of the top 10 systems in the country, and is one of the Chicago area's largest employers.

Illinois Masonic is one of the Advocate system's largest facilities, a major urban teaching hospital and a Level I trauma center that maintains operations around the clock.

York Chan is Director of Facilities for the hospital. Chan is also a member of the Board of Directors of the American Society for Healthcare Engineering (ASHE) and is a Certified Healthcare Facilities Manager (CHFM).

The challenge for hospitals

In few other places is the quality of the indoor environment so clearly a matter of life and death as it is in a hospital.

Hospital air quality must be rigorously managed, often—as in operating rooms and facilities for infectious or immune-compromised patients—room by room. Temperature, air flow, pressure, airborne particles, filtration, humidity and outside air all must be precisely controlled and constantly monitored. Both patient-borne disease agents and environmental pathogens must be controlled. Failure can be costly in both human and financial terms. Chan figures 2.7 times more energy is used per square foot than an office building—yet cutting energy consumption is difficult. The buildings run around the clock, year-round. And operating rules imposed by regulators must be met.

"We were wrapped up with energy conservation way before it was fashionable," said Chan "But my major focus is still the bottom line. Hospitals generally make four to five percent in margins at the end of the day. For every dollar that I save this hospital in energy, it precludes us from having to go out and look for $20 in new business.

"I can go up to my administration and say 'I saved you $100,000 last year in energy. That's the equivalent of you having to go out and look for $2 million dollars worth of new business.' It gets their attention."

Teamwork and technology build a healthy system

Illinois Masonic delivers those energy savings using state-of-the-art technology, operated by a team determined to watch every watt.

Chan has seen the hospital through numerous benchmarking exercises and energy audits.

"This is something I do differently than most facilities directors," Chan said. "I share my budget and bottom line with every member of my department. I actually go line item by line item. They look at the cost of energy, electricity and natural gas."

Jim Murphy, Electrical Foreman uses the Fluke 179 DMM to look at low voltage signals in the newly installed VFD for the 40+ year old steam system.

Building: 1908. Technology: 2009.

Teddy Roosevelt was President when Illinois Masonic's first building was constructed. But inside, the systems and controls are strictly 21st Century. In the 1980s, the hospital spent millions retrofitting the building with some of the first variable air volume (VAV) systems. More than 100 variable speed drives are in use, many responding to pressure and temperature sensors and the building automation system.

"We fully utilize our building automation to constantly look at our air and water systems to make sure they're fine-tuned," Chan said. "We'll reset the water temperature by one degree, and maybe that will delay the chillers coming on by one hour. We're constantly fine tuning our building operation system to look at our operational parameters."

Sensors installed throughout the mechanical systems support Chan's data-based management. For instance, filter loading is checked electronically. "When static pressure gets beyond 1.5 inches of water column, it gives us an alarm on our computer that says it's time to go change the filter," Chan said. "In the past, we'd schedule maintenance based on calendar time. Every three months we'd change that filter, regardless of whether it needed to be changed. Now we're not going to change that filter every three months, we're going to change it when it reaches 90 percent of useful life. We're extending the life of the filters. It's good for the environment and also good for my bottom line, because we're not paying for labor and materials to go change it unnecessarily."

Chan estimates that 60 to 65 percent of performance data comes from wired-in flow meters, current transducers and other sensors. The rest is gathered with portable test instruments, such as data loggers used to evaluate the power consumption of individual variable-speed drives. "The handheld tools, a lot of it is used for spot-checking. You're looking for temperature at a certain area, or temperature differentials across a coil—a one-time snapshot. The hard wired devices are more for long term data collection."

Icing on the cake

He sees energy savings delivering a "triple bottom line" with three key benefits: Economic Prosperity (profit); Environmental Stewardship (planet) and Social Responsibility (people).

Illinois Masonic has saved energy at every turn, with measures that include variable air volume systems, occupancy sensors that turn off lights in empty rooms, retrofitting high-efficiency lighting and using permanent and portable technology to monitor and control HVAC systems. The facility now uses 27 percent less energy than the average U.S. hospital, according to the U.S. Environmental Protection Agency's ENERGY STAR database. In terms of greenhouse gas emissions, it's like taking 1,433 cars off the road.

"Seventy-five percent of our success here is operational," Chan said. "It's procedures, it's not equipment. Looking at discharge temperatures, looking at hot water temperatures, and constantly making sure your equipment is delivering as designed."

The ENERGY STAR recognition is a rare honor. But for Chan, it's the natural outcome of decades of effort and hundreds of small steps. "In the end," Chan said, "getting the ENERGY STAR was just icing on the cake."

Darryl Dylla, HVAC/Power Plant Manager, uses a Fluke 62 Infrared Thermometer to check steam traps through-out the HVAC system.

Rolf Zoeller, Electrician uses the Fluke 1735 Three-Phase Power Logger to do load studies on the hospital's electrical systems. Keeping close tabs on these systems helped the hospital achieve its ENERGY STAR rating.

Fluke. *The Most Trusted Tools in the World.*

Fluke Corporation
PO Box 9090, Everett, WA 98206 U.S.A.

Fluke Europe B.V.
PO Box 1186, 5602 BD
Eindhoven, The Netherlands

For more information call:
In the U.S.A. (800) 443-5853 or
Fax (425) 446-5116
In Europe/M-East/Africa +31 (0) 40 2675 200 or
Fax +31 (0) 40 2675 222
In Canada (800)-36-FLUKE or
Fax (905) 890-6866
From other countries +1 (425) 446-5500 or
Fax +1 (425) 446-5116
Web access: http://www.fluke.com