



teletrol
building value

Project Profile

McMaster University



When it comes to saving energy, time and money, McMaster University's Physical Plant Department takes the University Vision Statement seriously.

Saving \$15 million (Canadian) over a twelve-year period took a lot of creativity, innovation and excellence... and certainly merits international distinction.

McMaster University is the outgrowth of educational work initiated by Baptists in the 1830's. Named after Senator William McMaster (1811-1887), the University was incorporated in 1887 by the Legislative Assembly of Ontario. More than 13,000 full-

Case Study Summary

Benefits

- \$15 million in energy savings over 12 year period
- 3% reduction in overall energy use even though campus area increased by 13.6%
- "Smart Alarm" makes maintenance personnel more efficient in troubleshooting and repair work

Challenges

- Development of a self-perpetuating, comprehensive energy management and conservation system covering over 45 buildings and 3.7 million s.f. of floor space

Solutions

- New Teletrol controls system all tied together over the University WAN
- Winter-chilled, water-free cooling system
- Chilled water distribution and performance enhancements
- Hybrid fresh-air VAV
- Two specialized interactive software applications developed: Energy Tracking and Advanced Warning & Predictive System

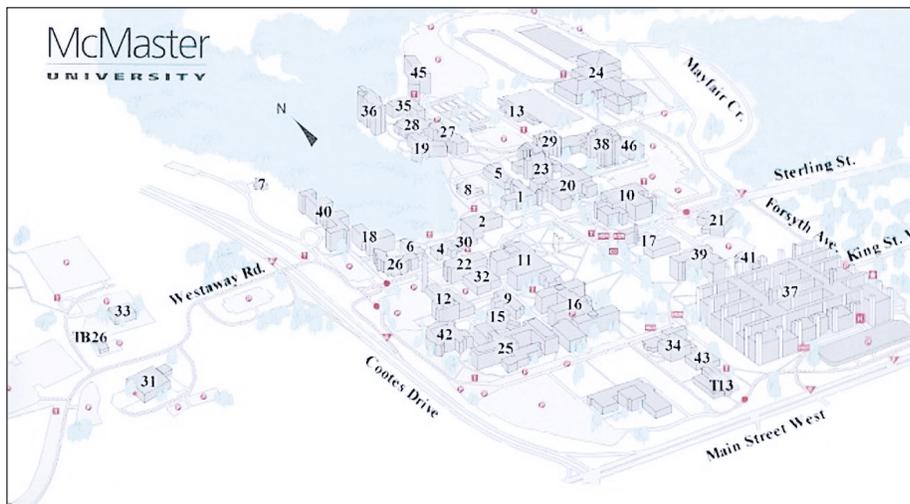
time students attend McMaster today. The University has earned the reputation as one of the leading post-secondary institutions in Canada. The extensive activity in



research, funded by more than \$74 million in grants and contracts, requires first-class libraries, laboratories, and other sophisticated equipment including a nuclear reactor and Van de Graaff Accelerator.

The McMaster campus comprises 296 acres, with 45 buildings for a total around 3.7 million sq.ft. of floor space. Beyond the money allocated for the diverse academic and research programs, maintenance and utility costs are an important line item in the University's annual budget. The combination of modern and historic facilities presents a variety of challenges for the University Physical Plant Department, not the least of which are to reduce energy consumption and maintenance costs, while improving energy performance, environmental and comfort conditions in the buildings.

An Energy Management Team composed of McMaster Physical Plant Department staff and professional external consultants from DukeSolutions Canada (formerly Chalifour, Marcotte et Associés) was put together in 1988 and charged with the responsibility to develop, establish and execute a self-perpetuating, comprehensive energy management and conservation plan. To meet their objectives, the Energy Management Team developed and executed a list of campus-wide projects including Winter Chilled Water Free



Cooling; Chilled Water Distribution and Performance Enhancements; Hybrid Fresh-Air VAV Design; Relamping; Chiller Performance Improvements; and other related Building Automation improvements.

After an examination of the scope of energy management and control work that they wanted to accomplish, the Energy Management Team selected Teletrol, because of the flexibility in programming, open protocol interfaces, and connectivity to the University Information Technology infrastructure. Given the extended time frame of the projects, positive consideration was also given to Teletrol's hardware design, which allows for a high degree of long-term compatibility by taking advantage of technological advances.

Over the ensuing 12 years, the Energy Management Team worked closely with Teletrol to design, engineer, install and pro-

gram Teletrol Integrator controllers in over 30 University buildings, tied together over the University campus-wide network. In the process of installing Teletrol controllers in their facilities, the Energy Management Team also developed two interactive software applications, Energy Tracking (MacPerform) and Advanced Warning and Predictive System (AWAPS), to gather energy data from the buildings and to help make the maintenance personnel more efficient in their trouble-shooting and repair work.

The AWAPS software combines the power and flexibility of the Teletrol controllers with the experience and knowledge base of the Physical Plant Department personnel to analyze and present "Smart Alarms". These Alarms are based on an evaluation of rules which compare the operational parameters of related equipment, and then pinpoint the

probable cause(s) of the Alarm condition(s) for more efficient maintenance response and repairs. Nuisance alarms are discarded or deferred, based on similar knowledge-based rules.

The Team published a report in June of 2000, to highlight Utilities Services Energy Management experiences over the past 12 years, and to report on the financial aspects of their work from 1989 to 2000.

The numbers were incredible:

Energy Performance: campus area (total sq.ft.) increased by 13.6% and campus energy use decreased by 3%

Energy Cost Performance: \$15,128,827 (Canadian) in cost avoidance to date.

Today, the McMaster University Physical Plant Department is balancing on-going maintenance costs, new construction requirements, and the growing

demands from aging buildings with creative designs and strategies, while coincidentally looking for innovative ways to finance the projects.

Teletrol congratulates the Physical Plant Department and the Energy Management Team for their tremendous success, and salutes their exceptional energy metering and management concepts and their use of Teletrol equipment to achieve their goals.



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