



Durham College Cuts Energy Usage While Expanding Facilities



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Ken Bright, energy czar of Durham College in Oshawa, Canada, realized he needed more electrical data in order to manage energy saving projects. The electrical monitoring system would be used to create a baseline with which to gauge his energy savings programs, as well as to prioritize energy savings opportunities. It would also be used to gain a firm understanding of where he used the most electrical energy, when demand peaks were being set, and to monitor power factor.

A means of being alerted to potential power quality issues was also needed. This was particularly important because the use of computers (common harmonic generators) in the college has increased dramatically over the last 12 years. It is estimated that there are 800 to 900 computers scattered through the two campuses in Oshawa and Whitby. There was also concern about harmonics generated by the high efficiency ballasts beginning to be installed throughout the college's buildings.

The solution came in 1991 when Ken approached Schneider Canada to discuss the Square D PowerLogic Power Monitoring System. Ken began with a few PowerLogic Circuit monitors and gradually expanded his system to access more detailed information.

Power disturbances are tracked in detail with the use of the waveform capture capabilities of the PowerLogic system. By reviewing the waveforms, potential problems can be identified well in advance of any serious consequences. Figure 2 shows a sample waveform capture recently used to identify a voltage sag that caused the failure of several pieces of equipment.

Ken found that by using waveform capture to study the harmonic behavior at the computer lab on the Oshawa campus, he was able to predict the harmonic behavior of a new lab to be installed in the Whitby campus. He was then able to take proactive steps ahead of time to mitigate potential problems. In this case, Square D non-linear transformers and voltage conditioners were installed.



Key consumption and demand power information to allowed energy reduction targets and priorities to be set. This has resulted in a number of energy conservation projects since installing the first Circuit Monitor. Some of these projects have included:

- Upgrading the perimeter, roadway and parking lot lights to energy efficient high-pressure sodium.
- Installing 250 motion sensors in classrooms, labs, and offices to reduce energy from lighting.
- Installing 41 Square D brand VSD and Telemecanique brand Altivar variable speed drives on the main ventilation system.
- Retrofitting 11 PowerLink Automatic Lighting Control panelboards into the main hallways, gymnasium and welding shop.
- Installing a Building Automation System throughout the campus to do automatic control.
- Upgrading 3600 square feet of windows to an energy efficient "R7" design

Data from the PowerLogic system is used to measure the reduction in electricity consumed and verify the projects are having the intended effects. Successful verification justifies expansion of successful efforts. Any project found not be as beneficial as hoped can be stopped, with resources diverted to higher payoff opportunities.

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