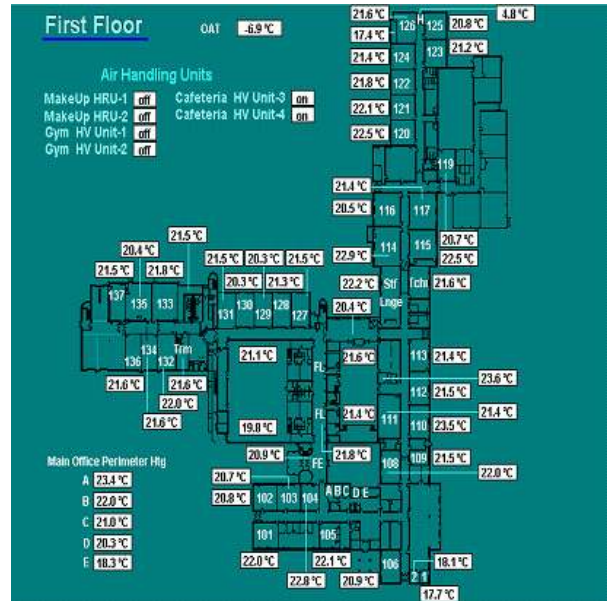


Case Study: Energy upgrades and optimization of Our Lady of Lourdes and St. James High School.

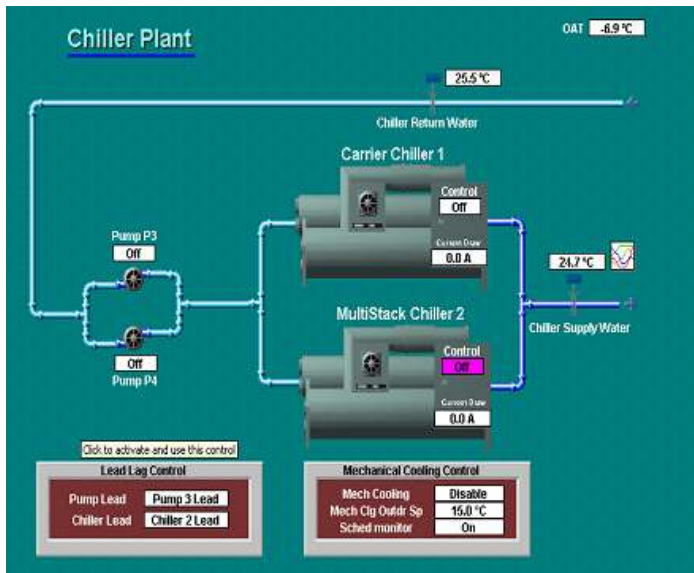
The Wellington Catholic District School Board (WCDSB) has a history being committed to energy management. As part of its energy initiatives they met with representatives of Guelph Hydro's Energy Services Department to discuss existing and proposed projects that would assist in reducing the overall operating costs at their various facilities. Many projects already had budget approval while others were not considered financially feasible at the time.

Two such projects that were considered not feasible were the automation control upgrade projects for Our Lady of Lourdes and St. James High School. However with the assistance of Guelph Hydro and incentives under the Conservation and Demand Management program, there appeared to be the potential for the projects to be resurrected.



Background

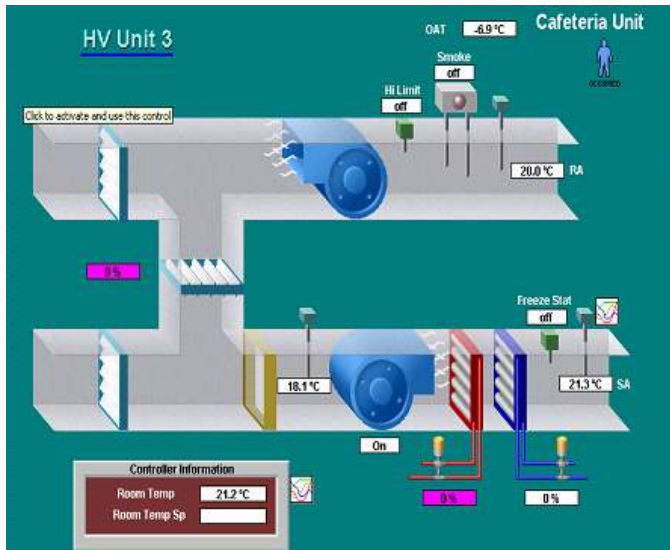
The original control system at both schools was a Honeywell Dos Based control system. Prior to the energy upgrades the heat pump loop system was running very inefficiently, most points were overridden, communication between the heat pumps and loop control panel did not exist. The old control system was rapidly deteriorating. Communication between the system and Operator Work Station was unreliable, causing numerous false alarms and providing incorrect data. There were a large number of controllers that were defective and indoor air quality and space temperatures were poor.



Prior to the energy upgrades at St. James, the Chiller plant would run all year round. Shutting down the chillers in winter would cause areas of the school to drastically overheat. Two large heat recovery units would often be shut down due to the unreliability of the old Micro Cell controllers and the danger of freezing water lines in winter. This resulted in poor indoor air quality and wild fluctuations in room temperatures. Because the chiller operated continuously there were numerous areas where the cooling and heating operated simultaneously.

Energy Upgrade Projects (Contracted to Accu-Temp Systems Inc.) -

1. The original Honeywell Micro Cell system was removed and replaced with a Honeywell Excel 5000 System.
2. The heat pump loop plant was optimized.
3. The boiler plant was optimized.
4. New controllers were installed on all Fan Coil Units, Unit Ventilators, Heat pumps and Variable Air Volume (VAV) Units. All faulty valves and actuators have been repaired or replaced.
5. The chiller plant at St. James was optimized. A new controller was added. The chiller was programmed to operate on a reset schedule and only allowed to operate when the outdoor temperature was above 60°F. Schedules were added for the chiller to shut down the chiller plant during unoccupied periods. The chiller pumps, which were both running constantly, were programmed for a lead/lag schedule and only operate when the chiller is required.
6. All outdoor lighting was added to proper controllers and controlled by astronomical schedules.



Both facilities are now controlled from a Honeywell Thin Client Web Based Opened System. Secure sign-on using any PC with a browser now obtains system access. This allows facilities personnel to receive alarms, view and make changes remotely.

The ability to view the school mechanical operations remotely has resulted in the ability to troubleshoot and solve heating and cooling problems more effectively, without the need for contractor call out. This has resulted in significant maintenance cost savings.

The automation upgrade project costs came to \$169,000. Guelph Hydro agreed to provide an incentive of 35% of the total project cost. The incentives came to a total \$59,150. Initial usage after the completion of the project indicates energy savings around 20%, which would result in savings of \$70,000 per year.

All data is now transferred from the sensor level and is continuously trended and monitored. It is expected that once heating and cooling schedules are optimized for both schools and the trending facility is fully utilized savings of 30% should be achievable. In addition fresh air intake has increased in most areas resulting in greatly increased indoor air quality.

The automation control upgrade at the two school is a prime example of Wellington Catholic District School Board and Guelph Hydro working together as partners in the interest of energy management and the customer. It is also a wonderful example of how energy management can reduce operating costs while greatly improving comfort conditions.