

## Energy Retrofit Case Study

### Swimming Pool Make-Up Water Control - Pilot Study



#### Facility Profile

The Centennial Recreation Centre in Scarborough has an indoor swimming pool, hockey rink, skating rink, community centre, and an auditorium. Its total building area is 8457 m<sup>2</sup>; the pool area is 240 m<sup>2</sup>.

Pool make-up water replaces water lost through evaporation, backwash, swimming drag-out, and intentional discharges (code regulations require the discharge of 20 litres of pool water per bather per day to ensure adequate water quality).

Before this project was implemented, the pool operator controlled make-up water manually.

#### Description of New System

- Toronto Public Health and Ministry of Health approved a test project to use the measurement of Total Dissolved Solids (TDS) in pool water to automatically regulate the daily make-up water requirements.
- TDS level increases over time, due to chemical treatment of the pool water (PH, Free Available Chlorine and Alkalinity).
- To control TDS level, a two- step strategy was approved for implementation:
  - 1) When TDS level increases above the set point, the Building Automation System (BAS) automatically opens a drain valve, which drains water from the pool.
  - 2) Because of drop in water level water, the Pool Water Level Control automatically (through the BAS system) opens the make-up water valve to add fresh water to the pool.
- TDS set point is 1,500 ppm above that of the new incoming City water; the TDS level in City’s water is about 500 ppm.

#### Benefits of New System

- TDS sensor automatically regulates the daily make-up water requirements.
- TDS level is now part of the daily monitoring of pool condition.
- The new system is a better indicator of deteriorating water quality than a number of bathers per day.
- In the 30-day sample (October 15 – November 14, 2007) the actual TDS level (366-491ppm) was well below set- point.
- Water savings result because excessive fresh water is no longer added to the swimming pool.
- Fuel savings result because less natural gas is needed to heat the new fresh water
- Water and fuel savings are estimated at \$21,000 per year
- Additional savings because of reduced chemical use have not been included.

Project Summary	
Project completion:	June 2007
Total project cost:	\$7,500
Estimated cost avoidance:	\$20,860/yr
Natural gas savings:	25,101 m <sup>3</sup> /yr
Water savings:	8.1 mil L/yr
Estimated CO <sub>2</sub> reduction:	50 tonnes/yr