Hamilton

OFFICE OF ENERGY INITIATIVES
ENERGY, FLEET & FACILITIES DIVISION

WATER & WASTEWATER PUMP STATION ENERGY EFFICIENCY PROGRAM

ONTARIO POWER AUTHORITY

HydraTek

1. BACKGROUND

The Ontario Power Authority's Conservation Fund has initiated a Pilot Study Program to employ province wide pump efficiency assessments to selected Municipal Water & Wastewater system operators by means of subsidized testing incentives.
The program titled Toward Municipal Sector Conservation: A Pump Efficiency Assessment and Awareness Pilot Study will evaluate the energy performance of 150 water pumps across the Province in conjunction with seven municipal partners. The results and findings will provide the basis for industry benchmarking and energy conservation.

The City of Hamilton has accepted an offer to perform thermodynamic testing under this program in partnership with Hydratek and the OPA. Hydratek is a firm specializing in advanced hydraulics and energy system design and evaluation. Thermodynamic testing method is generally regarded as a very efficient and highly accurate method and this program will help increase awareness and understanding of the benefits that such testing has to offer resulting in the wider adoption of conservation practices and leading towards a more sustainable existence.

2. PROJECT IMPLEMENTATION

The thermodynamic testing technology employed by Hydratek utilizes multiple temperature and pressure probes connected to both sides of individual pumps to measures the heat gain in the water across a pump as a measure of the pump's inefficiency. The energy which is not imparted to the water as flow and pressure is actually wasted to heat.

Discharge valve throttling is used to simulate different operating points. Data is uploaded to a computer which has custom power metering synchronized to the hydraulic data collection. This approach yields an accuracy of +/- 1% for efficiency calculations.

The results of the tests show:

- **Actual pump efficiency and performance**
  Pump efficiency is an excellent indicator of pump health and degree of degradation, and is a key measure to inform preventative maintenance.

- **Estimates of energy and cost savings**
  Comparing the results of the testing with original manufacturer information, or identifying improvements to pump operations, can provide an indication of how much energy can be saved. Cost savings can accordingly be estimated which help to develop business cases around pump retrofits, replacement, as well as operational strategies.

The City of Hamilton has selected a number of key pump stations for review under this testing procedure, based on station priority and energy savings potential. Testing is expected to commence during the first quarter of 2012.

3. PROJECT BENEFITS

Among the project benefits listed by the OPA/Hydratek partnership are:

- New energy savings initiatives will be validated and pursued jointly through the Office of Energy Initiatives and Water & WasteWater for the City of Hamilton;
- Participation and pump performance benchmarking within a province wide testing survey;
- Verification of existing pump and meter operational performance;
- Provision of independently derived, high accuracy data for system planning and optimization.

Upon completion of these evaluations for the City of Hamilton and other selected Municipalities in Ontario, the OPA will publish the province wide results later this year.