A One Year Test Incentive for Programmable Controls Systems Provides An Opportunity to Assess Actual Energy Savings, Permanence and Reliability

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Introduction

Since 1988, when Ontario Hydro first began to implement DSM incentive programs through product rebates and building design, programs have evolved to encourage the installation of comprehensive packages of measures with incentives based on potential savings, their impact on load profile and more recently proven savings on performance. Throughout this progression, building control systems have been largely ignored.

Building Control Systems can assist in the efficient operation, control and monitoring of a building's energy system. They can provide improved work environments for building occupants while contributing to energy savings and the utility's demand reductions. In 1991, it was decided after consultation with controls industry personnel, to design a one year test incentive that would improve both the utility's and the control industry's knowledge and experience regarding the application of control systems. Through the knowledge gleaned from actual installations, experience will be obtained in the shortest time possible; actual DSM savings will be achieved; and questions involving control's equipment permanence, life, reliability and other issues will be addressed.

Program Design

The test initiative has been designed considering both the control technology available as well as the utility requirements for demand reduction.

Program Eligibility And Criteria

Incentives are offered to Commercial and Industrial retrofit customers in Ontario who install programmable control systems with the intent of reducing electrical energy or peak demand between the period of September 1991 and December 1992.

Control systems must operate over at least part of the utility's peak period (7am-11pm) and must demonstrate electrical energy/demand savings during that time.

Equipment, Monitoring and Maintenance Requirements

All systems must include the following features. Equipment must be a computer based programmable device with stand alone capability. It must measure and store run-time and other operation parameters; be programmed with limits on key control parameters; and alert central monitoring station when limits are exceeded.

The central monitoring system must operate continuously. It must be capable of scheduled dial-out to a control device and that control device must be capable of uploading data for report generation. Monthly status reports containing readable, accurate information must be generated and submitted to the utility for monitoring purposes.

A five year maintenance contract must be negotiated between the manufacturer and the customer. The contract must include: all control equipment; all labour and parts for repairs; and routine scheduled preventative maintenance. In addition, all other mechanical equipment must be covered by an existing maintenance contracts.

Financial Incentives

Incentives for this program have been awarded in a two step process to ensure equipment has been properly commissioned and utilized, that equipment is reliable and that estimated savings translate into actual savings.

Four cents/kWh savings per year will be awarded to the CUSTOMER following the completion and approval of a pre-determined feasibility study, an internal energy analysis which simulates the application, an internal utility avoided costs test and the successful installation and commissioning of system.

Four cents/kWh will then be awarded to the VENDOR (who can give it to the customer or use it for further technology development) after confirmation of the performance of the system during a one year period. This

information will be attained through the submission of monthly tracking records of energy used relative to base year data. The incentive will be capped at 50% of the total project cost.

Program Benefits

Customer Benefits

These include; lower electricity bills, improved comfort conditions for occupants, increased tenant/occupant satisfaction, capital and operating improvements to building systems with a large financial discount, an opportunity to learn about other Ontario Hydro incentive programs.

Controls Industry Benefits

These include; increased market penetration in the retrofit market, and increased credibility and market potential resulting from working with Ontario Hydro.

Utility Benefits

These include; potential for a significant contribution to DSM targets from a previously under-utilized technology, an opportunity to further exploit and expand the role of controls for DSM programs, forging of stronger links with a new and important ally industry, further promotion of the philosophy of payment on performance, and an opportunity to conduct individual site monitoring and tracking procedures.

Expected Results

As shown in Table 1, during the one year test it is estimated that a total of 6 MWs will be saved. The initial estimates shown in Table 1 were derived from market segment research on the potential in the commercial sector as well as information from the control manufacturers.

Initial results, which can be seen on Poster display illustrate that estimated and actual savings do vary. This can be attributed to a number of factors including; inaccuracies in the feasibility study or the energy analysis that are performed before a project is accepted (these are scrutinized both internally and externally so they should not be a major contributor to discrepancies); poor installation or commissioning; no or inadequate operator training; poor subsequent maintenance (this should be avoided since a maintenance contract is required).

As more results become available each of these factors will be investigated so that by the end of the monitoring process the test incentive objectives including accounting for the actual energy savings, as well as understanding the permanence and the reliability of Control Systems will be realized.

Table 1. Expected Results from the One Year Test

Segment	Proposed No. of Projects	Anticipated Demand* Savings (MW)	Anticipated Incentives ($)
Offices	10	1.6	700,000
Retail	5	0.7	195,000
Hospitality	5	0.6	200,000
Institutional	15	2.8	575,000
Multi-Residential	5	0.3	80,000
Totals	40	6.0	1,750,000

* Translated from kWh estimates for the 16 hour peak.