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Savings through energy efficiency

Gas & Electric Integration

April 12, 2011
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C&I Management Committee

Agenda

Review of efficiency programs prior to & after the Green Communities Act

- Whole Building Assessment
- Long Term Customer Engagements
- Direct Install
- Large Retrofit
- New Construction

- Additional Integrated Offerings

Three Year Plan/GCA

"The Council shall, as part of its review of plans, examine opportunities to offer joint programs providing similar efficiency measures that save more than 1 fuel resource or to coordinate programs targeted at saving more than one fuel resource. Any costs for joint programs shall be allocated equitably among the efficiency programs."

Benefits of Integration Outlined in the Three Year Plan

- Enhanced customer service, including fuel-blind recommendations and priorities for energy savings and simplified application processes.
- Simplified consistent messaging to customers and other market actors.
- Economies and efficiency in program delivery.
- Capturing more comprehensive savings at participating facilities.
- Improved cost-effectiveness analysis that ensures all gas, electric, and non-energy benefits are identified

Program Delivery

Prior to Integration:

- No routine communication between gas & electric PA's
- Customer required to separately contact each PA
- Separate
  - site meetings
  - analysis
  - incentive offers
- Did not address interactive savings of gas & electric measures

With Integration:

- Continuous working relationships between gas & electric PA's
- The first PA contacted coordinates with other PA and participant
- Both PA's at all customer meetings
- PA's agree how to conduct & fund analysis
- Interactive savings of gas & electric measures
- Dual Fuel Screening Tools are encouraging greater depth of savings
- Combined Gas & Electric Incentive Offers

Benefits of Dual Fuel Screening

Case Study 1: Reduced costs in a commercial kitchen with demand control ventilation		
	$/kWh	$/therm
Screened Alone	$ 23.13	$ 5.00
Duel Fuel Screening	$ 12.25	$ 2.35

Dual Fuel Screening VS. Separate Fuel Screening

Case Study 2: Reduced technical assistance costs in a large hospital		
	Electric PA	Gas PA
Screened Alone (50% of the cost)	$ 12,000	$ -
Duel Fuel Screening	$ 7,000	$ 5,000

Reducing Costs to Individual PA's

Whole Building Assessment

Integrated Administration

- Shared process documents and cost-sharing methodology

Integrated Delivery

- Combined EEM eligibility & incentive review
- Joint approval of final report and collaboration on implementation

Results – Promoting Deeper Dives:

- Simplifies customer participation
- Promotes long-term project planning

Long Term Energy Planning Agreements

Memorandum of Understanding between customer & gas / electric PA's to achieve long term energy reduction:

- Depth of savings required to achieve
- Gas & electric offerings packaged together to meet aggressive energy savings goals
- Custom plans tailored toward largest business customers

- Provides custom incentives for comprehensive approach

Direct Install Program

- Electric PA vendor trained to identify both gas and electric measures including custom opportunities
- Gas Direct Install measures
  - High Efficiency Pre Rinse Spray Valve
  - Programmable Thermostats
  - Low Flow Shower Heads & Faucet Aerators
  - Pipe & Duct Insulation
  - Indoor Boiler Reset Controls
- Seamless delivery incorporating inter-PA billing

Large Retrofit Program: Case Study of 130,000 Square Foot Corporate Office

The Challenge:

- This corporate office was under consideration for relocation out of state
- Threat of significant job loss
- Thirty year old HVAC system
- Large portion of the building was vacant due to downsizing

Meeting this challenge:

- Collaboration between the customer, gas PA, electric PA & local government
- PA's proposed that a consideration in this decision be the opportunity to significantly reduce existing energy operating cost
- $11,000 Energy analysis co-funded by the gas & electric Pa's
- Identified excellent potential tenant to fully occupy building

Project Description

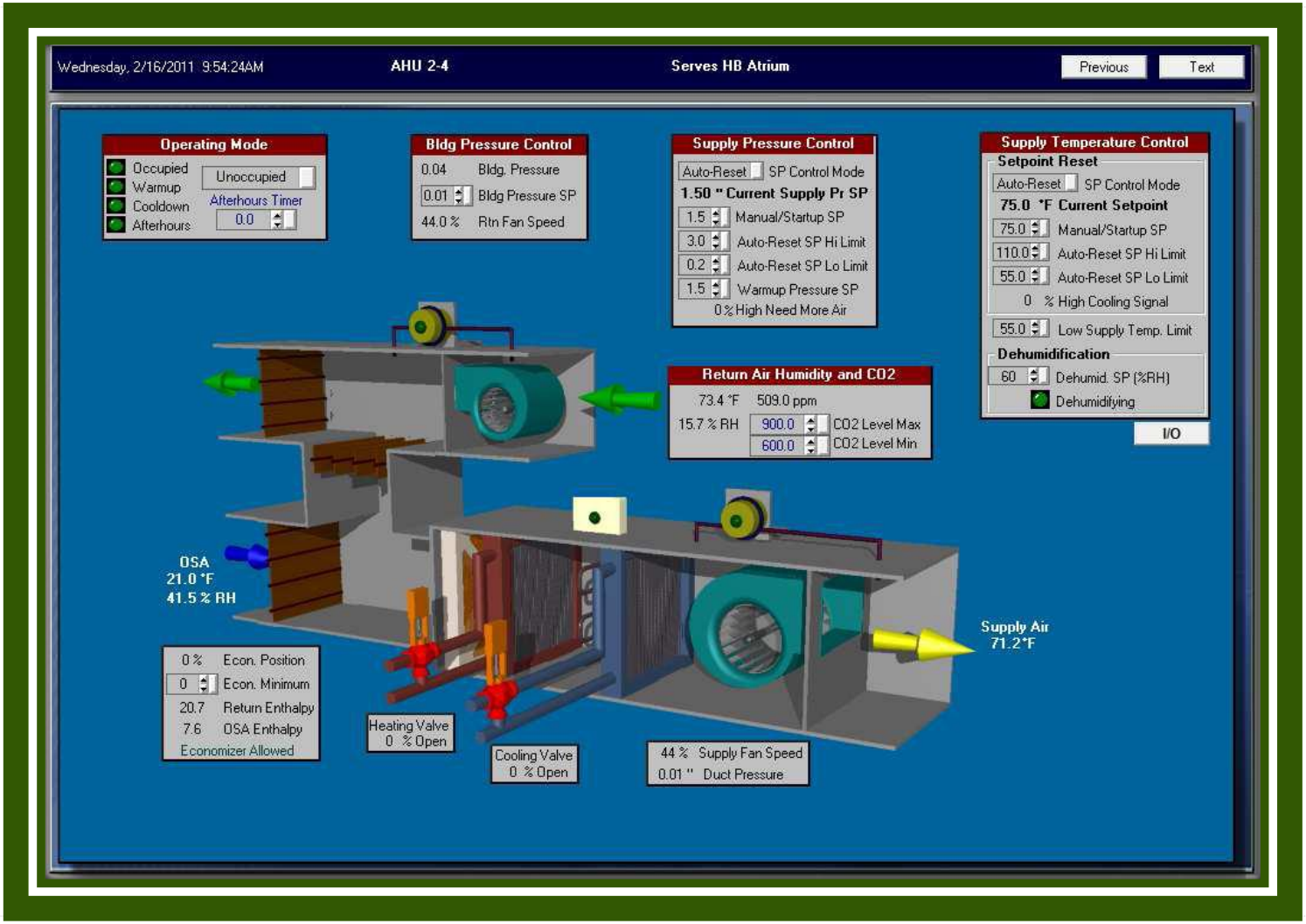
BEFORE:

- Building conditioned by inefficient roof top units installed in 1983
- Existing Energy Management System very far out of calibration
- Many large HVAC units not tied to the EMS causing simultaneous operation of heating & cooling

AFTER:

- Replaced 42 roof top units with very high efficiency units
- Upgraded & expanded Energy Management System
- Installed high efficiency motors with Variable Frequency Drive Controls.
- Replaced oversized 12,000 CFM air handler with 2,800 CFM fan
- Optimum startup, nighttime/weekend setback
- On demand operation of gas boiler, pumps, & chiller

Significant Expansion of Energy Management System



Summary of Success

- Total Gas savings:
  94,000 therms
- Gas PA incentive: $50,000
- Total Electric Savings:
  702,000 kWh
- Electric PA incentive:
  $81,000
- Total value to customer of gas & electric energy savings:
  $231,000 per year
- This customer and these jobs have stayed in Massachusetts

New Construction

- Advanced Buildings-Core Performance
  - High efficiency design for smaller buildings
  - Combined incentive offered on $/SF basis
- Comprehensive Design Approach (CDA)
  - High efficiency design for larger buildings involving energy modeling of both gas & electric measures
  - Shared Technical Assistance & engineering cost assistance provided

Case Study

- New 110,000 square foot school
- Gas & electric PA's proposed Advanced Buildings-Core Performance at initial meeting
- Enthusiastic reception from municipality & design team

Estimated annual savings VS code from efficiency measures:

- 95,500 kWh
- 9,500 therms
- Additional 86,000 kWh from PV

Combined gas & electric incentive @ $1.50 / square foot

Gas / Electric Integration: Present State

- Single Gas / Electric Application Forms
  - Prescriptive EMS
  - Pay for Performance
- Combined Dual Fuel Screening Tool
- Marketing Initiatives
  - Collateral based on efficiency measure packaging by sector rather than measure type
- Massachusetts Technology Assessment Committee
  - Evaluation of New Gas and Electric Technologies
    - Refrigeration Case Covers
    - ECM Motors for Walk In Coolers

Trade Allies: Changing their Business to Implement Integrated Measures

- Trade Ally Open Houses incorporated information on both gas and electric energy efficiency measures
- Increased incentive offer for installing three or more different technologies
- Some lighting contractors have expanded their offerings to include non-lighting measures
  - VFD motor controls
  - Compressed air
  - Vending machine control

Thank You

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Appendix

-for handout-

Large Retrofit Case Study #2: Regional Wastewater Treatment Facility

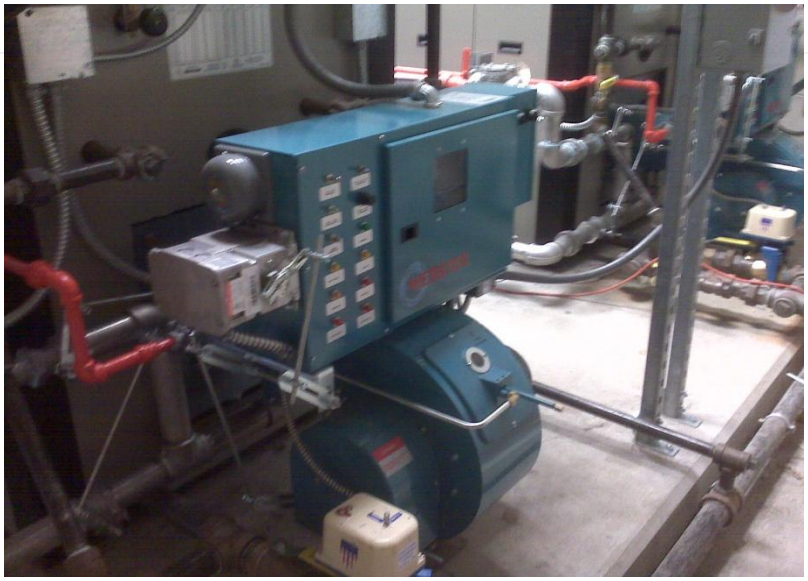
- **Co-funded the Comprehensive Energy Evaluation**

Comprehensive Study Cost	**$29,440**
Gas PA contribution	$4,720
Electric PA contribution	$15,000
Customer Contribution	**$9,720**

- **Customer Benefits**
  - Total Gas savings - 259,000 therms
  - Gas PA incentive- $125,000
  - Total Electric Savings- 4,000,000 kWh
  - Electric PA incentive over $1,000,000

Gas Measures - Boilers and Burner

- New Boilers
- New Dual Fuel Burners
  - Digester Gas
  - Natural Gas



Gas Measures

- Insulated Steam Condensate Tank

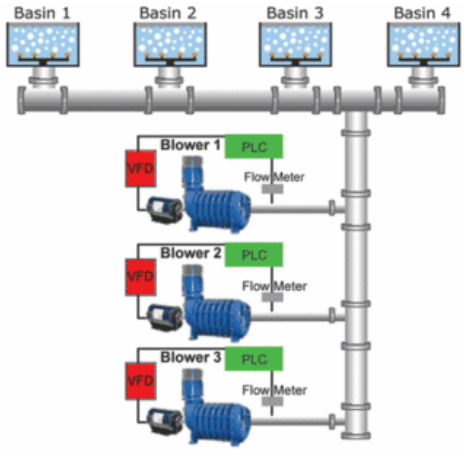
- Programmable Thermostats

Electric Measure – Lighting

- New light fixtures and controls

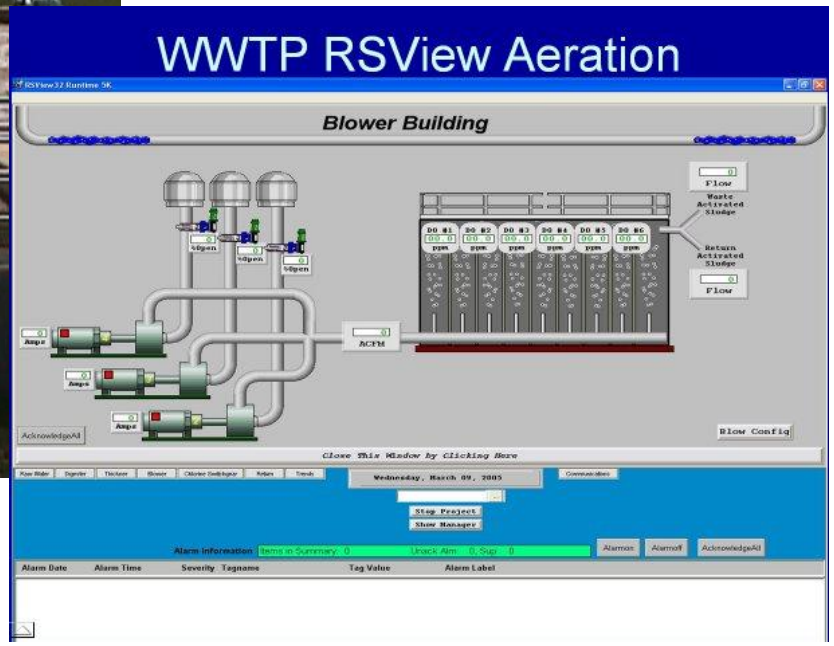
Electric Measure - Controls

- Aeration Blower Pressure Controls



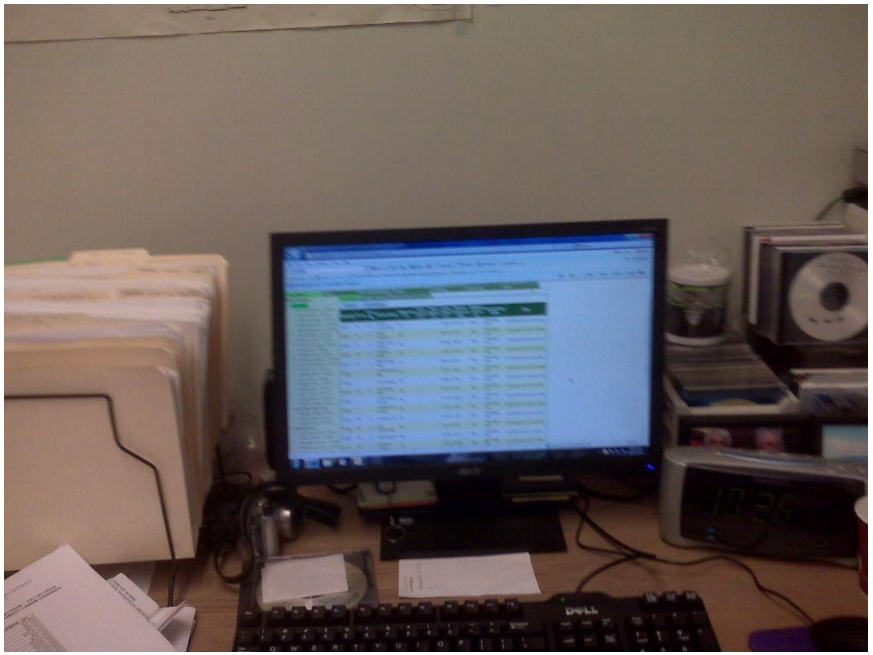
Electric Measure - Controls

- Dissolved Oxygen Controls



Electric Measure – VFD's

- Variable Frequency Drives on Process Pumps

Gas and Electric Measure - EMS

- New Energy Management System