RECOMMISSIONING REPORT

<Engineering Firm>

Presented to:
<Customer>
<Presentation Date>

Funding by:

<Report Date>

This report is for sample purposes only. The customer's actual report will contain information and recommendations based upon the engineering firm's findings and may or may not reflect the format and recommendations contained in this sample report.

Contents

Executive Summary

Under the Xcel Energy Recommissioning Program, <*Engineering Firm*> completed a recommissioning study at <*Customer Address*>. The goal of the Xcel Energy Recommissioning Program is to achieve demand and energy savings in commercial buildings in the Xcel Energy Minnesota service territory. This study focuses on your building's existing equipment and identifies ways to make them run more efficiently. Savings are realized through the systematic evaluation of building systems and implementation of low-cost and no-cost measures targeted to improve system operation and, in many cases, improve occupant comfort.

As a result of these activities, 2 were identified, and are presented in the Summary of Recommendations. While all measures on the list are recommended for implementation, a subset of measures are anticipated to deliver significant demand and cost savings, and to be readily implemented in <year>.

For each of the measures anticipated to deliver savings, engineering estimates of electrical demand, energy and cost saving potential, implementation cost, and simple payback period were done. The primary recommendations are as follows:

1. *Repair Air Flow Sensors*
2. *Convert Pneumatic controls to DDC*

The total estimated savings for the recommended Recommissioning measures totals <*kW*>, <*kWh/year*> and <*$ per year energy cost savings*>. The initial estimated implementation cost for these measures is<*$*>, resulting in a simple payback of only < *years* >. Many of the measures identified also qualify for an Xcel Energy rebate. If you implement all the suggested Recommissioning measures, you could earn up to a rebate of < $XXXXX from Xcel Energy. The final implementation cost estimate or quote will be provided by <*customer vendor*>.

These recommendations are broken into three different categories within the rebate form including prescriptive, recommissioning and custom. Prescriptive measures can be applied for through Xcel Energy's Conservation Programs, as can Custom measures. *(Please note that custom measures do need to be pre-approved.)*

Xcel Energy Disclaimer

The estimated costs shown for each opportunity are based on previous experience with comparable cost reduction plans in other facilities. While the energy conservation and load management measures contained in this report have been reviewed for technical accuracy, Xcel Energy and VENDOR do not guarantee the cost savings or reduction in total energy requirements presented in the recommendations. Xcel Energy and VENDOR shall, in no event, be liable to CUSTOMER in the event that the potential energy savings are not achieved.

The recommendations are based on an analysis of conditions observed at the time of the survey, information provided by Xcel Energy and costs based upon VENDOR experience on similar projects. Estimated savings are computed on the basis of research by government agencies product literature, and engineering associations. Actual savings will depend on many factors including: conservation measures implemented, seasonal weather variations, fuel price increases and specific energy use practices of the facility's occupants and workers. Performance guidelines provided in the report are for informational purposes only and are not to be construed as a design document. This report is written for energy saving purposes only and should not be used for bid specifications.

Xcel Energy will not benefit in any way from your decision to select a particular contractor or vendor to supply or install the products and measures recommended by VENDOR. You are encouraged to ask for the option of contractors or suppliers you have worked with in the past for further information on the suggested measures.

Disturbance, removal or replacement of building material, insulation system, high intensity discharge and fluorescent lamps, lamp ballasts, power factor correction capacitors, starting and running capacitors of motors and other potentially hazardous components that contain asbestos, mercury or PCB's will require proper handling and disposal in accordance with applicable federal and state laws and regulations. It is the customer's responsibility to ensure that the contractor follows such guidelines in implementing the recommendations of this report.

Xcel Energy advises that customers check with their Xcel Energy sales representative to determine the estimated value of their rebate and to verify that the equipment qualifies for Xcel Energy programs prior to implementing any conservation measure. Some measures identified in this report may qualify for an Xcel Energy Custom Efficiency rebate. Custom Efficiency projects require pre-approval prior to purchase and installation. The customer is responsible for submitting project information to their Xcel Energy sales representative to obtain pre-approval for Custom Efficiency projects and to determine the eligible custom rebate amount.

Introduction

This report presents the findings resulting from the Recommissioning study conducted at <*location*>. The Xcel Energy Recommissioning Program is designed to achieve demand and energy savings in commercial buildings in the Xcel Energy Minnesota territory. Savings are realized through the systematic evaluation of building systems and implementation of low-cost and no-cost measures, targeted to improve system operation and, in many cases, improve occupant comfort.

The primary objectives of the Recommissioning Program are as follows:

- Reduce energy demand and expenditures
- Reduce operation and maintenance expenditures
- Improve building system control and occupant comfort
- Recommend additional energy saving opportunities on capital projects that are identified during this investigation.

A detailed on-site investigation of the primary energy-using equipment in the building was conducted <*dates*> with <*customer contact*>. For each selected piece of equipment, functional test procedures were carried out. Equipment was inspected for proper operation, with assistance of checklists.

Contact Information

Service Address:	ABC Building 414 Nicollet Mall Minnesota City, MN 55403
Account numbers:	0123456789 electric 2345678910 gas
Customer Contact (at building):	John Petersen, Facility Manager Phone: 612/330-1234 Fax: 612/330-5678
Alternate Customer Contact:	Julie Anderson, President Phone: 763/263-1234 Fax: 763/265-6789
Engineering Firm:	Peterson and Associates
Principal Engineer:	Jessie Peterson
Xcel Energy Representative:	Jeff Jackson Phone: 612/337-1234 Fax: 612/337-5678
Date(s) study performed:	June 12, 2004
Electric Service Provided by:	Xcel Energy
Gas Service Provided by:	Xcel Energy
Type of Building:	Office Building
Building Square Feet:	130,000 square feet
Peak demand:	1,456 kW

Building Description

- Gross Area

Classrooms 1st and 2nd floors	45,000 Sq. Ft.
Classroom addition	10,000 Sq. Ft.
Gymnasium	10,000 Sq. Ft.
Auditorium	12,000 Sq. Ft.

-Classrooms Approximately 65 years old (constructed in 1939)
Remodeled 4 years ago (2000)

-Gymnasium and Auditorium Approximately 3 years old (constructed in 2001)

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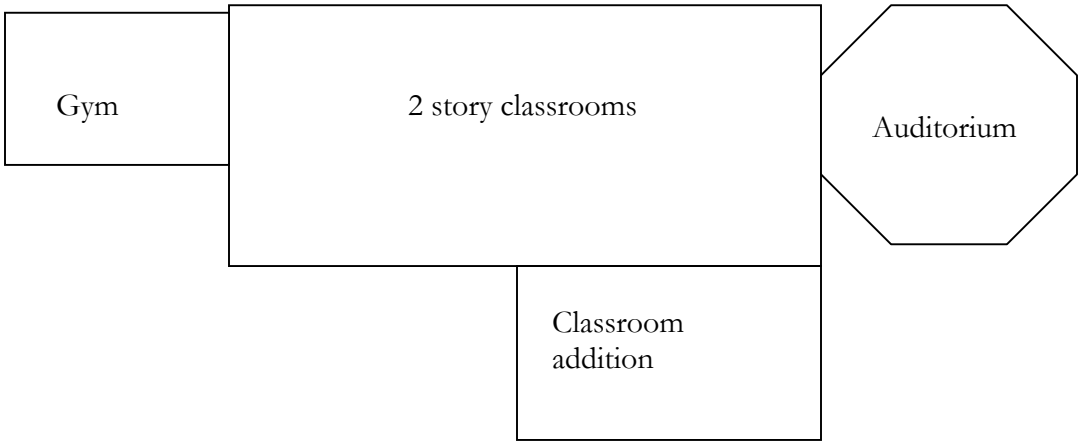


- One peak control time-of-day electric service for the buildings is 292 kW. Some lighting is shut off during peak control periods.
- A Control System International (CSI) building energy management system (EMS) was installed in 1990. The EMS was expanded in 1995 to include automated monitoring & control of five (5) new air-handling units and other miscellaneous HVAC systems.
- Electrical distribution wiring for the 2nd floor was upgraded in 1994.
- Five new air handling units (AHU's) were installed in 1995 (AHU's 2, 5, 8, 9)
- One new ASD was installed in 1998
- New energy efficient windows were installed in 2000
- Normal business hours are from 8 am-5 pm
- Summer hours are from 12 pm-3 pm
- Domestic hot water is provided by two older gas fired hot water heaters
  - 180 F Dishwasher
  - 180 F Domestic
- Most air handling units operate as follows
  - Summer 6am-1am
  - Winter 6 am- midnight

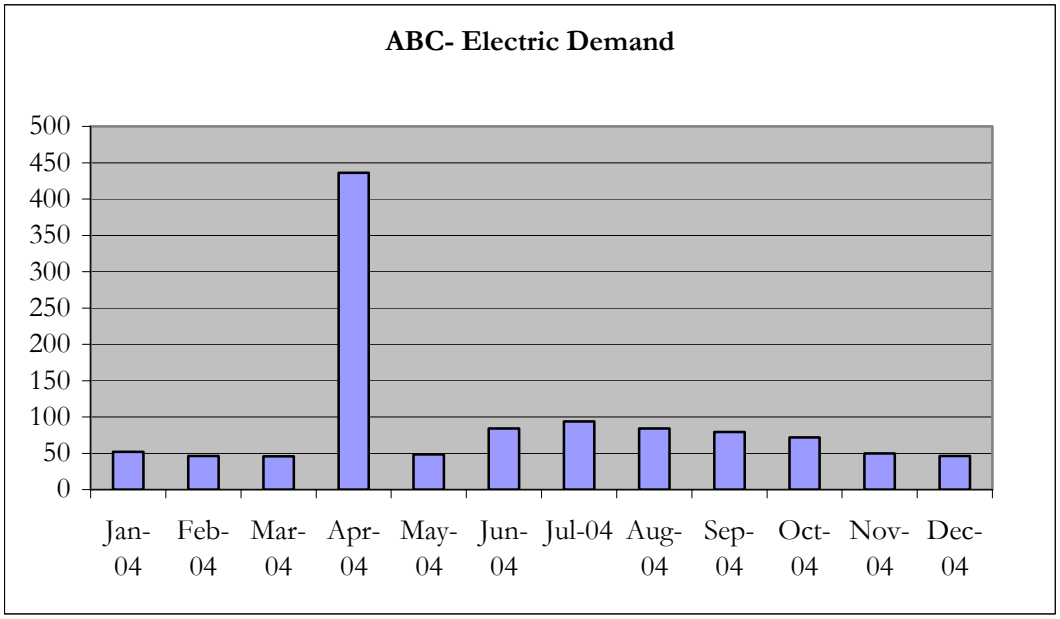
Electric and Natural Gas Utility Summary

	Annual Cost
Electric Services:	
Building A	$100,000
Building B	$ 1,000
Total Electric Cost	$101,000
Natural Gas Service:	
Building A	$130,000
Building B	$ 13,000
Total Natural Gas Cost	$143,000

Annual Electric & Gas Costs $244,000

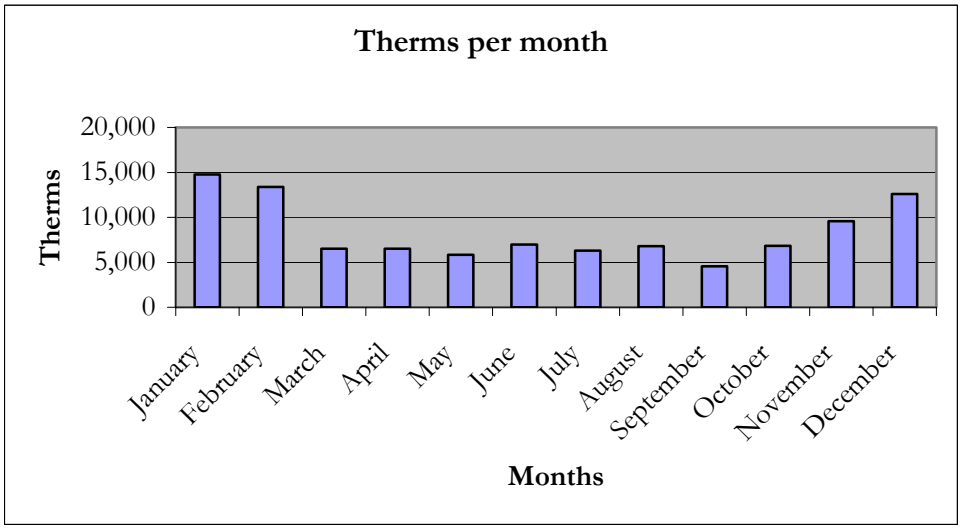
Annual Electric Consumption

Month/Yr	Days	Actual Demand kW	Power Factor	Billed Demand kW	Total Energy kWh	Total Cost	Cost/kWh	Load Factor
Jan-04	32	52	91.00%	53	20560	$1,056.27	$0.05100	50.50%
Feb-04	31	46.4	90.81%	53	18560	$995.69	$0.05365	47.10%
Mar-04	29	45.6	91.40%	53	17120	$947.84	$0.05536	46.40%
Apr-04	30	436	90.51%	53	17200	$924.25	$0.05435	36.60%
May-04	29	48.4	90.29%	53	17480	$1,609.53	$0.05287	47.90%
Jun-04	32	84	90.93%	84	23600	$2,193.41	$0.06820	48.50%
Jul-04	30	94	93.68%	94	36640	$2,064.44	$0.05986	36.60%
Aug-04	29	84	93.89%	84	35360	$1,992.85	$0.05837	54.10%
Sep-04	32	79.2	93.42%	79	35400	$1,226.28	$0.05689	60.50%
Oct-04	29	72	91.75%	72	23440	$914.57	$0.05468	58.30%
Nov-04	29	50	90.13%	50	18720	$1,004.07	$0.05690	46.80%
Dec-04	33	46.4	90.03%	46	20440	$1,002.23	$0.05690	53.80%
Total	365	746	91.02%	777	284520	$15,864.00	$0.05364	52.70%
Average	30	62.2	91.49%	65	23710	$1,322.01	$0.05576	50.20%



Annual Gas Consumption

Month	Year	Therms	Cost	Cost/Therm
January	3	14,783	$10,630	$0.72
February	3	13,375	$10,595	$0.79
March	3	6,506	$7,503	$1.15
April	3	6,503	$5,422	$0.83
May	3	5,832	$52,336	$8.97
June	3	6,985	$6,072	$0.87
July	3	6,303	$5,060	$0.80
August	2	6,802	$3,299	$0.49
September	2	4,562	$2,802	$0.61
October	2	6,841	$5,682	$0.83
November	2	9,583	$6,895	$0.72
December	2	12,593	$8,651	$0.69
Total	2	100,668	$124,947	$17.48
Average		8,389	$10,412	1.46



Electric Demand, Energy & Cost Allocation (Summer demand)

	Peak Summer On-demand kW	Estimated Hrs/Mo	Annual Energy kWh	Annual Cost*	%
Lighting					
Classrooms	60		243,523	$15,257	10.00%
Addition	30		122,326	$7,664	4.50%
Gym	25		99,565	$6,238	3.00%
Auditorium	15		33,435	$2,095	1.50%
Ventilation	34.5		213,325	$13,365	17.00%
Space Cooling					
Air Cooled Chiller	92		142,500	$8,928	20.00%
VAV	38		57,900	$3,627	4.00%
Space Heating					
Boilers	1	Winter	2,000	$125	1.00%
Pumps	2.4	Winter	13,939	$873	10.00%
Kitchen Equipment					
Appliance	40		192,000	$12,029	9.00%
Refrigerator	20		120,000	$7,518	5.00%
Dishwater	70		80,000	$5,263	15.00%
Allocation Total	427.9		1,320,513	$82,981	100.00%
Actual Total	430		1,400,000	$83,000	

*At $0.06265/kWh

* Assume a portion of night electric demand occurs during on-peak demand period

Electric Demand & Energy Allocation (Typical Winter Month)

	Peak Summer On-Demand kW	Hrs/Mo	Annual Energy kWh	Energy Cost*
Lighting				
Classrooms	36	500	18,000	$1,128
Addition	10.5	500	5,250	$329
Gym	5	500	10,000	$300
Auditorium	10	500	10,000	$300
Ventilation	35	468	16,708	$1,047
Space Heating				
Pumps	3.4	600	2,052	$129
Electical	5	300	1,500	$94
Kitchen Equipment				
Appliance	40	400	16,000	$1,002
Refrigerator	20	600	12,000	$752
Dishwater	70	120	8,400	$526
Allocation Total	234.9		99,910	$5,607
Actual Total	240		103,000	$6,000

* At $ 0.06265/kWh

Electrical Systems on at Night (2 AM to 4AM)

	Electrical Demand Winter	Demand (kW) summer
Security Lights		
Indoor	5	5
Outdoor	10	10
Ventilation	10	10
Space Cooling	8.4	
Space Heating	8.4	
Kitchen Refrigerator	20	20
Allocation Total	61.8	45
Actual Total	65	50

Natural Gas Energy & Cost Allocation

	Annual Energy Therms	Annual* Cost	%
Space Heating			
	26676	20460	60%
Water Heating	15120	11597	30%
Kitchen Appliances	5522	4235	10%
Allocation Total	47318	36292	100%
Actual Total	49000	37800	

* At $ 0.7.67/Therms

Base Winter Gas Use = 3,500 Therms/Mo (October- May)

Estimated Annual Space Heating Gas Use+ 77,124 Therms (October-May)
-3,500 Therms/Mo x 8 Mo= 49,124

-Assume 70% Space Heat = 34,384 Therms
-Assume 30% Kitchen Make-Up Air Heat = 49,124 x .3 = 14,747 Therms

Kitchen Appliances
52,004 Therms- 15,120 Therms-522 Therms
-10,004 Therms-420 Therms-120 Therms
= 20,818 Therms

Investigated Findings

The investigation phase of the project involved conducting a detailed site assessment, conducting functional tests to verify proper equipment operation, and collecting operating data both to establish a basis of savings estimates, and to verify correct operation.

Systems Investigated

The primary energy-using equipment in the building HVAC system, listed in <Appendix>, were the subject of the recommissioning investigation. In general, the recommissioning effort focused on the following equipment:

- Air Handling Units
- Chillers
- Cooling Tower
- Primary CHW and TW pumps

Other areas of the building were looked at, including lighting and motors, however they were not a main focus of this investigation.

Recommissioning procedures

Air Handling Unit inspection

- Delta temperature across hot and cold decks to see if simultaneously heating and cooling ("fighting") is occuring
- Excess minimum outdoor air through outside air dampers or through Economizer dampers that are not fully closed
- Supply air static air pressure on VFD controlled AHU fans to see if excessive.
- Check air flow sensors to see if correct information is being relayed

Chillers

- Staging of the chillers: analyze chiller logs for existing staging efficiency and for optimizing further.
- Tower Water Supply temperature; can it be lowered during the cooler months?

Energy Management System

- Determine if an upgrade to DDC might result in significant energy savings.

Energy Conservation Opportunities

The following table, "Summary Sheet," presents all the recommissioning actions that we advise, as a result of the Recommissioning Investigation. A summary of each recommended Recommissioning measure is given in the following sections along with the detailed kW Demand and energy savings calculations.

Energy Conservation Opportunities

ECO #1	Repair airflow sensor
ECO #2	Convert to DDC

Electric rates are based upon the most current rate from Xcel Energy, with all the fees and taxes loaded. The energy rates used in this report are:

- $0.03107 per kWh
- $9.26 per On-Peak kW demand during the summer
- $6.61 per On-Peak kW during the winter
- $6.00per MMBtu or Dekatherm (DTH) of natural gas

CONSERVATIONWISE from Xcel Energy

Xcel Energy Recommissioning/Engineering
Summary of Energy

Instructions: Complete this form to determine applicable rebate amounts. Before using this spreadsheet, in Excel, go to Tools/Macro/Security. Make sure that the Security Level is set to Medium or Low. If Security need to exit and then relaunch Excel in order for the setting to take effect. If Security is set on Medium, you will need to select the "Enable Macros" button in order for the Recommissioning Tool to function correctl **form upon completion of recommissioning measures and return a copy of this form and all related equipment/labor invoices to the customer's Xcel Energy Account Manager.**

Customer Information Date _____ **Engineering Firm Information**

Company name _____ Prepared by (Engineering Firm) _____
Complete service address _____ Contact Name _____
Customer contact name _____ Phone _____
Customer contact phone _____ E-mail* _____
Customer e-mail* _____
Electric account number _____
Check if Xcel Energy Electric ☐ Xcel Energy Account Manager _____
Natural gas account number _____ Check if using Xcel Energy Financing ☐
Check if Xcel Energy Gas ☐

* By providing an e-mail address, you are giving us permission to send e-mail regarding this and other programs and services.

ECO #	Energy Conservation Opportunity	Summer Peak Demand Savings (kW)	Annual Energy Savings (kWh)	Heat Energy Savings (MMBTU)	Estimated Annual Electric Cost Savings	Estimated Annual Gas Cost Savings	Estimated Other Cost Savings	Gross Cost of Opportunity	Simple Payback *(years)*	Estimated Prescriptive Rebate	Estimated Recommissioning Conservation Rebate	Check if Custom Efficiency Application Required
Other Savings Opportunities	**(Non-Rebatable energy savings, rate savings, load management, water savings, etc.)**											
TOTALS												
	Recommissioning											
	Prescriptive											
	Custom											
	Other											

RULES & REQUIREMENTS

By signing this form, customer does hereby certify that 1. All recommissioning work is complete and operational prior to submitting rebate; and 2. All rules of this Xcel Energy program have been follow acknowledges that participation in the rebate program shall impose no liability on Xcel Energy. In particular, Xcel Energy shall not be liable for the work performed by the customer's engineer, contract are estimates only. Actual savings may vary.

Actual rebate amounts subject to review by Xcel Energy.

Rebates are available for Xcel Energy business customers in Minnesota only.

Customers must apply for rebates within one year of the purchase date shown on equipment invoice for a given measure.

Xcel Energy's conservation rebate programs are subject to 60 days' notice of cancellation. The customer is responsible for checking with the Business Solution Center at 1-800-481-4700 to ask wheth effect and to verify program parameters.

Customer should sign all implemented recommissioning lines and submit to Xcel Energy Account Manager, along with invoices, upon completion to determine final rebate amount.

Customer is responsible for providing actual costs for each recommissioning measure implemented.

ENERGY CONSERVATION OPPORTUNITY #1 – Repair Air Flow Sensor

Air handling unit S-1 has two return fans, R-1 and R-2. Normal operating hours are 6 AM to 6 PM, M thru F. Recalibrate the four air flow sensors for S-1 and its two return/relief fans, RR-1 and RR-2.

Because the air flow sensors are not working, R-1 and R-2 are running at their design capacities, and S-1 is supplying 24,520 CFM.

After recalibration, the fans will run at a lower volume, providing electrical savings.

Current Operation

	Air Flow (cfm)	Min OA (cfm)	SP ("w.c.)	Brake hp	Motor hp	Operating hours per week	Motor efficiency
S-1	24,520	2,720	4.5	NA	25	60	0.936
R-1	14,300	NA	2	NA	7.5	60	0.91
R-2	7,500	NA	0.5	NA	2	60	0.865

Assume that horsepower savings can be calculated according to the fan laws, and that each of the motors is currently operating at its rated capacity.

	Air Flow (cfm)	Min OA (cfm)	SP ("w.c.)	Brake hp	Motor hp	Operating hours per week	Motor efficiency	Demand Savings (kW)	Energy Savings (kWh)
S-1	24,520	10,000	4.5	25	25.00	60	0.936	0	0
R-1	9,525	NA	2	7.5	2.22	60	0.91	4	13,514
R-2	4,995	NA	0.5	2	0.59	60	0.865	1	3,792
Total								6	17,306

Energy Cost Savings

6 kW x ($9.26/kW/month x 4 months) + 6 kW x ($6.61/kW/month x 4 months) = $540

17,306 x $.03107/kWh = $538

$540 + $538 = $1078

Economic Summary:

Annual cost savings $1078

Initial cost $200 for sensor repair

ENERGY CONSERVATION OPPORTUNITY #2 – Convert to DDC

The existing pneumatic temperature controls installed in 1991 have been adjusted and bypassed. Also, building operators do not have a good understanding of pneumatic controls.

The existing pneumatic temperature controls do not include state-of-the-art energy saving control strategies.

Description Of Proposed Energy Conservation Opportunity

Convert mechanical room HVAC systems (AHU's, pumps, boiler, chiller, Etc.) from pneumatic temperature controls to direct digital electronic temperature controls. The new direct digital temperature controls will include the following energy saving temperature control strategies:

- Unoccupied space temperature setback during winter heating months.
- Unoccupied space temperature setup during summer cooling months.
- Hot water temperature reset (Outdoor reset control).
- Chilled water temperature reset during spring and fall months when cooling loads are light.
- Discharge air temperature reset during spring, fall & winter months to reduce terminal reheat.
- Outside air optimization with minimum outside air damper adjustment.
- Programmed start/stop of AHU's, chiller, boiler & pumps.

Economic Summary

- Annual Energy Savings:

Electric Demand Reduction	1.94 kW
Electric Energy Reduction	62,756 kWh/Yr
Natural Gas Reduction	4,460 Therms/Yr

See detailed calculations in Appendix

- Annual Energy Cost Savings:

Electric Demand	= 1.94 kW x 4 Mo x $ 9.26.kW
	= $ 72/Yr
Electric Energy	= 62,756 kWh/Yr x $ 0.031/kWh
	= $1,940/Yr
Natural Gas	= 4,460 Therms/Yr x $ 0.60/Therm
	= $ 2,676/Yr

Total Energy Cost Savings = $4688

- Initial Cost:

Gross Cost = $ 46,359 (See attached vendor proposal in Appendix)

For More Information

In addition to the energy conservation measures we recommend in this report, Xcel Energy offers cash rebates. You can discuss eligibility requirements with your Xcel Energy representative. You also can call the Xcel Energy Business Solutions Center at 1-800-481-4700 for more information about qualifying for cash rebates and special discount rates. Xcel Energy hopes you find this information valuable and that you consider adapting the strategies that are outlined.

Appendix A: Additional information such as inventory, data logs, vendor proposals, and detailed calculations