Vendors Please Note:
As a participating vendor of this program, it is your responsibility to fill out this form correctly, note where there is non-applicable language, use correct rate codes and assure the report is accurate to the best of your knowledge. **The intended purpose of this document is a starting point for your analysis—this is NOT a fill-in-the blank form.**

COMPRESSED AIR EFFICIENCY STUDY REPORT

<Customer>

Completed by:
<Engineering Firm>

<Report Date>

Funding by:

Report completed by:_____(signature)
Date:_____

This report was created using a template based on common scenarios for this type of equipment. If you believe there is an error or inaccuracy regarding your equipment, please call your Xcel Energy representative.

CONTENTS

1. CUSTOMER INFORMATION

Name

Address

City

State

Zip Code

Contact(s)

Telephone

Fax

Type of Business

Rate Information

Xcel Energy Account Number

Use either method demand/energy or estimated average to estimate cost and energy savings

Demand Rate:

October – May	$6.61
June – September	$9.26

Energy Rate:

Peak	$.031
Off Peak	

OR

Estimated Average Electrical Rate for total meter

Total energy and demand bill divided by total energy

(Demand charges + Energy charges)/ total monthly kWh

($2,500 + $4,000)/144,444 kWh = $0.045/kWh*

*This does not include fuel clause adjustment

Operating Hours

8,760 total hours in use

Formula for Average annual Energy

Average BHP x .746 / Motor Efficiency x Electrical Cost x Hours of Operation

2. EXECUTIVE SUMMARY

Under the Xcel Energy Compressed Air Efficiency Study Program, <*Engineering Firm*> completed a compressed air study at <*Customer Address*>. The goal of the Xcel Energy Compressed Air Efficiency Program is to achieve demand and energy savings in commercial buildings in the Xcel Energy Minnesota service territory. Every effort has been made to collect meaningful information, to locate and tag every possible air leak, to provide the customer with accurate information, and to make recommendations that will not only improve the compressed air system's performance but make economical sense as well.

System Parameters

Calculated Average CFM Demand	855 CFM
Peak CFM Recorded	1484 CFM
PSIG Low Recording	91 PSIG
PSIG High Recording	102 PSIG

Facility Operation

Annual Operating Hours	8,730 hours

Estimated Annual Energy Consumption

Online Average kW	140.2 kW
Estimated Average kW Cost	$0.0475
Estimated kWh	1,282,090 kWh Estimated Annual
Energy Expense	$60,899.25

Leak Summary

Number of Leaks (Incidences)	**66**
Estimated CFM Lost to Leakage	82 CFM
Estimated kWh savings	119,300 kWh
Estimated Annual Expense Associated to Leaks	$5,667.22

Waste Summary

Please do not delete any items below—if it is not applicable to the customer please note "N/A" in the space next to it. Please list all waste components below.
(Must be less than one year payback)*

1 - Blower - .2-year payback - If Blowers are Zero report Zero saving, but leave section in place.

Number of nozzles (Incidences)	**10**
Estimated CFM Lost to Blower	40 CFM
Estimated kWh savings	58,950 kWh
Estimated Annual Expense Associated to Blower	$2,800.22

2 – Remove Cabinet Cooler - .1-year payback- If Cabinets are Zero report Zero saving, but leave section in place.

Number of Cooler (Incidences)	**4**
Estimated CFM Lost to Coolers	80 CFM
Estimated kWh savings	115,300 kWh
Estimated Annual Expense Associated to Coolers	$5,485.22

3 – Pressure Reduction - .1-year payback - If Pressure Reduction is Zero report Zero saving, but leave section in place.

Pressure Reduction (Incidences)	**1**
Estimated PSIG reduction	15 PSIG
Estimated kWh savings @ 15/2=7.5 %	96,000 kWh
Estimated Annual Expense Associated to Coolers	$4,567.01

4 – Unidentified #4 uses with less than 1-year payback - If Unidentified #4 are Zero report Zero saving, but leave section in place.

Number of Unidentified #4 (Incidences)	**15**
Estimated CFM Lost to Unidentified #4	100 CFM
Estimated kWh savings	126,300 kWh
Estimated Annual Expense Associated to Unidentified #4	$6,000.00

If more sections are required insert additional sections using Waste Item #5, etc.

Grand total of incidences	**66 + 10 + 4 + 1 +15=91**
PSIG total reduction	**15 PSIG**
CFM total reduction	**82+40+80+100=302 CFM**
Energy kWh reduction	**119,300+58,950+115,300+96,000+126,300=515,850**
Dollar total savings	**$5,667+$2,800+$5,485+$4,567+$6,000=$24,519**

Note: if the project is over one year payback please include it in the Recommendations for Custom Solutions (section 5.4b)

2.1 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.

Some recommendations identified in this report may qualify for an Xcel Energy Custom Efficiency rebate (Leaks or Waste measures do not qualify for Custom Efficiency rebates). 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. 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.

2.2 Background

This report presents the findings resulting from the compressed air study conducted at <*location*>. Savings are realized through the systematic evaluation of compressed air systems and repairing at least 50% of leaks and waste, targeted to improve system operation and save on energy costs.

The primary objectives of the Compressed Air Efficiency Program are as follows:

- Reduce energy demand and expenditures
- Reduce operation and maintenance expenditures
- Improve system efficiency and operation

A detailed on-site study of the compressed air system(s) in the building was conducted <*dates*> with <*customer contact*>. For each system, functional test procedures were carried out. Equipment was inspected for proper operation and leaks and waste.

3. EQUIPMENT INVENTORY

Air Compressor

Customer Designation	#1
Location	New Compressor Area
Manufacture	Brand A
Model	123456
Serial Number	S157273
Type	Lubricated single-stage rotary
Manufacture Date	September 2003
Rated Capacity	470 CFM @ 100 PSIG
Capacity Control	Variable Displacement/Turnvalve
Control	Electronic
Main Motor	100 HP, ODP, 1.15 SF, 95.4% Efficiency
Full Load BHP	109.1 BHP
Cooling Method	Ambient Air
Fan Motor BHP	3.4 BHP
Estimated Package kW	88.1 kW (full capacity)
Status	On

Air Compressor

Customer Designation	#2
Location	New Compressor Area
Manufacture	Brand A
Model	123456
Serial Number	S161453
Type	Lubricated single-stage rotary
Manufacture Date	November 2003
Rated Capacity	470 CFM @ 100 PSIG
Capacity Control	Variable Displacement/Turnvalve
Control	Electronic
Main Motor	100 HP, ODP, 1.15 SF, 95.4% Efficiency
Full Load BHP	109.1 BHP
Cooling Method	Ambient Air
Fan Motor BHP	3.4 BHP
Estimated Package kW	88.1 kW (full capacity)
Status	On

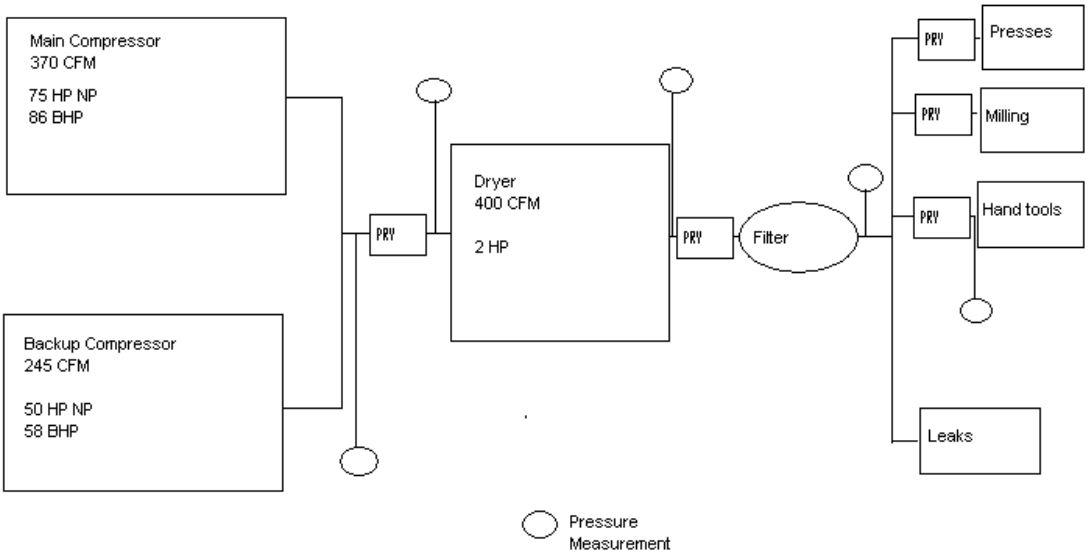
Air Dryer

Customer Designation	None
Location	Old Compressor Room
Manufacturer	Brand A
Model	XXX-XXX
Serial Number	TR133639P-017267
Type	Refrigerant
Manufacture Date	N/A
Rated Capacity	500 SCFM @ 100 PSIG
Control	Non-Cycling
Compressor HP	3 HP
Cooling Method	Water
Fan Motor HP & Quantity	N/A
Estimated Package kW	2.5 kW
Status	Off/Back-Up
Corresponding Filtration	N/A
Manufacture	N/A
Model	N/A
Type	N/A

Air Receiver(s)

Manufacturer	N/A
Manufacturer Date	1993
Model	N/A
Type	Vertical
Capacity	400 Gallons
Pressure	200 PSIG
Cubic Foot per Atmosphere	53.5 CF
Safety Relief Valve	Yes
Location	Near Old Compressor Room
Control Device In/Out/None	None

3.1 System Block Diagram (EXAMPLE ONLY)



4. BASELINE

4.1 System Operation

The compressed air system at <*Customer*> facility operates <*x*> hours a day, <*x*> days per week, or approximately <*x*> hours annually (leaving <*x*> hours for maintenance). The system consists of <*x*> <*xx*> HP <*Name of Equipment*> lubricated rotary air compressors, with three air compressors online and available to produce compressed air immediately based upon the system's CFM demand, and the fourth air compressor, designated as a back-up unit. The three main air compressors share a <*Name of Equipment*> <*xxxx*> SCFM refrigerated air dryer and main inline coalescing filtration, while the back-up unit has it's own refrigerated air dryer and filtration.

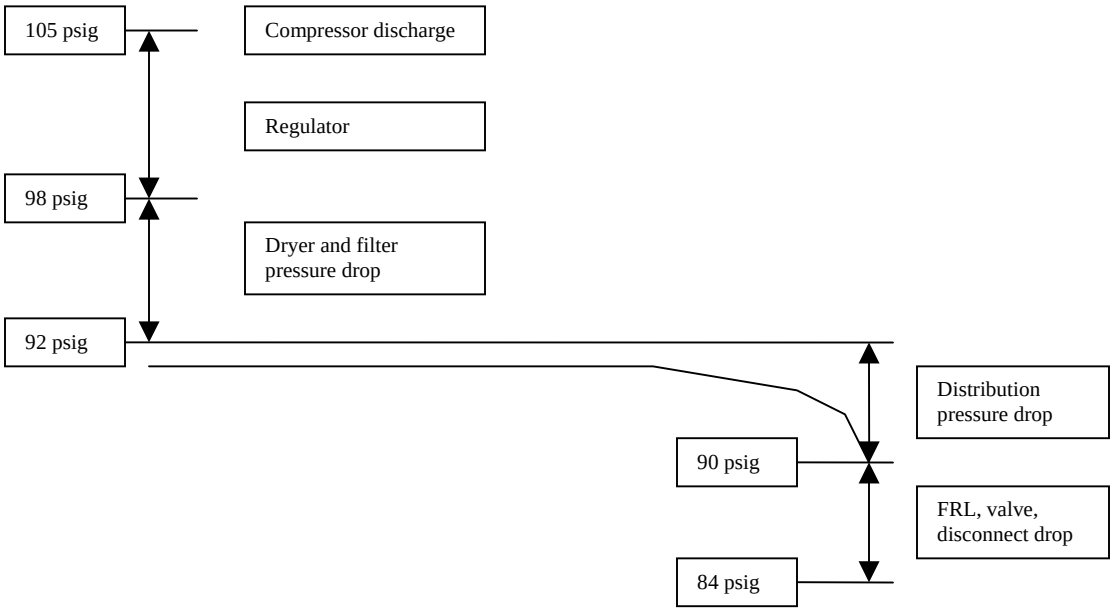
The <*Name of Equipment*> <*xx*> HP air compressors communicate with each via their individual electronic controllers and sequence with each other, coming either online when CFM demand is high, or shutting down when the CFM demand decreases. It appears for the average CFM demand over the seven sample days (<*xxx*> CFM), two <*xx*> HP air compressors are required to be online, with the third unit in a standby condition.

A <*xxx*>-gallon vertical air receiver is located near the old compressor room. Both it's size (<*xxx*> gallons/<*xx*>CF) and it's lack of pressure differential or an inlet-metering device means the air receiver offers very little to the compressed air system.

All the compressed air system components are maintained on a regular basis and appear to be in a good operating condition.

To establish an average CFM and kW benchmark, the calculated average CFM demand and average kW over a 168-hour sample period is <*xxx*> CFM and <xxx> kW. Remember, average CFM and kW demand averages the highs and lows and produces a general numeric value to provide an example/estimate of the CFM demand and energy consumed; just as the data collected during the survey and recommendations made in the survey assumes all other operational days are similar or equal.

Current Pressure Drop Diagram (EXAMPLE ONLY)



4.2A Initial Baseline[1] with waste and leaks <u>included</u>

All the following should be included in this section: air pressure, power, annual energy use, total air flow (loaded/unloaded), temperature, leak and waste load included, and annual energy cost

Standard Operating Parameters

Calculated Average CFM Demand	855 CFM
Peak CFM Recorded	1484 CFM
PSIG Low Recording	91 PSIG
PSIG High Recording	120 PSIG
Brand A 100 HP	On @ 100% Capacity
Brand A 100 HP	On @ 82% Capacity
Brand A 100 HP	Off
Old Brand A 100 HP	Off
Brand A Refrigerated Air Dryer	On

Calculations

100 HP Air Compressor = 109 BHP .746 / 0.954 =	85.3 kW
Fan Motor = 3.4 BHP x .746 / 0.9 =	2.8 kW
Package kW =	**88.1 kW**

100 HP Air Compressor = 109 BHP .746 / 0.954 =	85.3 kW
85.3 kW x 86.5% (adjustment for capacity) =	73.8 kW
Fan Motor = 3.4 BHP x .746 / 0.9 =	2.8 kW
Package kW =	**76.6 kW**

Refrigerant Air Dryer = 9 BHP x .746 / 0.9 =	7.5 kW

Total Estimated Maximum Online kW	**172.2 kW**
Total Estimated Average Online kW	140.2 kW
Annual energy/hours per year	1,223,946/8730=140.2 kW

ESTIMATED ANNUAL ENERGY CONSUMPTION
140.2 kW x $0.0475 x 8730 hours = $58,137.35

EFFICIENCY VALUE CALCULATION
855 CFM (average demand) / 140.2 kW (average energy estimate) = 6 CF/kW

[1] See appendix (Section 7) for all supporting charts and graphs.

4.2B Initial Baseline[2] with waste and leaks excluded

All the following should be included in this section: air pressure, power, annual energy use, total air flow (loaded/unloaded), temperature, leak and waste load included, and annual energy cost

Standard Operating Parameters

Calculated Average CFM Demand	855 CFM –302 Waste =553 CFM
Peak CFM Recorded	1484 CFM
PSIG Low Recording	91 PSIG
PSIG High Recording	120 PSIG –15 =105 PSI
Brand A 100 HP	On @ 100% Capacity
Brand A 100 HP	On @ 60% Capacity
Brand A 100 HP	Off
Old Brand A 100 HP	Off
Brand A Refrigerated Air Dryer	On

Calculations

100 HP Air Compressor = 109 BHP .746 / 0.954 =	85.3 kW
Fan Motor = 3.4 BHP x .746 / 0.9 =	2.8 kW
Package kW =	**88.1 kW**

100 HP Air Compressor = 109 BHP .746 / 0.954 =	85.3 kW
85.3 kW x 86.5% (adjustment for capacity) =	73.8 kW
Fan Motor = 3.4 BHP x .746 / 0.9 =	2.8 kW
Package kW =	**76.6 kW**

Refrigerant Air Dryer = 9 BHP x .746 / 0.9 =	7.5 kW

Total Estimated Maximum Online kW	**172.2 kW**
Total Estimated Average Online kW	140.2 kW – 60 =81 kW
Annual energy/hours per year	(1,223,946-515,850)/8730=81 kW

ESTIMATED ANNUAL ENERGY CONSUMPTION without Leaks and Waste
81 kW x $0.0475 x 8730 hours = $33,634

[2] See appendix for all supporting charts and graphs.

4.3 New Baseline

Please provide new baseline parameters according to your suggested improvements (not including leaks and waste) and maintenance changes to the system. You must include: air pressure, power, annual energy use, total air flow (loaded and unloaded), temperature, no leaks and waste load, and annual energy cost

Standard Operating Parameters

Calculated Average CFM Demand	XXX CFM
Peak CFM Recorded	XXX CFM
PSIG Low Recording	XX PSIG
PSIG High Recording	XXX PSIG
Brand A 100 HP	On @ 100% Capacity
New Brand A 100 HP	On @ 40% Capacity
Brand A 100 HP	Off
Old Brand A 100 HP	Off
Brand A Refrigerated Air Dryer	On

Calculations

100 HP Air Compressor = 109 BHP .746 / 0.954 = XX kW
Fan Motor = 3.4 BHP x .746 / 0.9 = XX kW
Package kW = XX kW

100 HP Air Compressor = 109 BHP .746 / 0.954 = XX kW
85.3 kW x 40% (adjustment for capacity) = XX kW
Fan Motor = 3.4 BHP x .746 / 0.9 = XX kW
Package kW = XX kW

Refrigerant Air Dryer = 9 BHP x .746 / 0.9 = XX kW

Total Estimated Maximum Online kW XX kW
Total Estimated Average Online kW XX kW
Annual energy/hours per year (708,096-184,296)/8730=60 kW

ESTIMATED ANNUAL ENERGY CONSUMPTION
60.2 kW x $0.0475 x 8730 hours = $XX,XXX.XX

EFFICIENCY VALUE CALCULATION

553 CFM (average demand) / 60 kW (average energy estimate) = X CF/kW

5. TOTAL LOSS INFORMATION RESULTS (LEAKS AND WASTE)

5.1 Leak Information Results

<*Engineering Firm*> performed the leak check using the SDT-101 ultrasonic leak detector. Leaks were located, tagged, and logged with notation as to the approximate CFM flow loss and are summarized below. Please note all CFM values are estimated and are not exact numbers. An experienced technician assigns CFM values based upon case history and his field experience.

Leak Table
*Leaks must be marked off **after inspection trip** as "Fixed" or "Not"*
Leak can be itemized in CFM or in size (S, M, L, XL, XXL, etc)

Location / Description		Check	Size
Machine # SV-50	Bench Quick Disconnect	Fixed	S
Machine # SV-50	Quick Disconnect Floor	Fixed	S
Machine # SV-50	Air Gun	Fixed	S
Station 12	Air Nozzle	Fixed	S
Station 12	Air Gun	Fixed	S
Station 12	Air Nozzle	Fixed	S
Station 12	Air Gun	Fixed	S
NH6300	Air Sander	Fixed	M
MV653	Air Nozzle	Not	S
Maint. Area	Air Hoist	Fixed	M
1 Ton Hoist	Quick Disconnect	Fixed	S
MV653	Air Nozzle	Fixed	S
Maint. Area	Air Hoist	Fixed	S
1 Ton Hoist	Quick Disconnect	Fixed	S
Mori 20	Regulator Coupling	Fixed	S
Maint. Area	Air Hoist	Fixed	S
Engineering	NPT filter connection	Fixed	S
1 Ton Hoist	Quick Disconnect	Fixed	S
MV653	Air Nozzle	Not	S
Maint. Area	Air Hoist	Fixed	S

1 Ton Hoist	Quick Disconnect	Fixed	S
MV653	Air Nozzle	Fixed	S
Maint. Area	Air Hoist	Fixed	S
1 Ton Hoist	Quick Disconnect	Fixed	S
Mori 20	Regulator Coupling	Fixed	S
MV653	Air Nozzle	Not	S
Maint. Area	Air Hoist	Fixed	S
1 Ton Hoist	Quick Disconnect	Fixed	S
MV653	Air Nozzle	Fixed	S
Maint. Area	Air Hoist	Fixed	S
1 Ton Hoist	Quick Disconnect	Fixed	S
Mori 20	Regulator Coupling	Fixed	S
Maint. Area	Air Hoist	Fixed	S
Engineering	NPT filter connection	Fixed	S
1 Ton Hoist	Quick Disconnect	Fixed	S
Mori 20	Regulator Coupling	Fixed	S
Maint. Area	Air Hoist	Fixed	S
Engineering	NPT filter connection	Fixed	S
Maint. Area	Air Hoist	Fixed	S
Engineering	NPT filter connection	Fixed	S
1 Ton Hoist	Quick Disconnect	Fixed	S
Mori 20	Regulator Coupling	Fixed	M
Maint. Area	Air Hoist	Fixed	M
Engineering	NPT filter connection	Fixed	M
1 Ton Hoist	Quick Disconnect	Fixed	S
Goff Area	Bench Quick Disconnect	Not	S
Dyna Quip	Air Nozzle	Not	S
Manual Press	Packaging in Air clamp	Fixed	S
Auto Press	Regulator	Fixed	S

MV653	Air Nozzle	Not	S
Maint. Area	Air Hoist	Fixed	M
1 Ton Hoist	Quick Disconnect	Fixed	S
MV653	Air Nozzle	Fixed	S
Maint. Area	Air Hoist	Fixed	S
1 Ton Hoist	Quick Disconnect	Fixed	S
Mori 20	Regulator Coupling	Fixed	M
Maint. Area	Air Hoist	Fixed	L
Engineering	NPT filter connection	Fixed	S
1 Ton Hoist	Quick Disconnect	Fixed	S
Mori 20	Regulator Coupling	Fixed	M
Maint. Area	Air Hoist	Fixed	L
Engineering	NPT filter connection	Fixed	M
1 Ton Hoist	Quick Disconnect	Fixed	S
Goff Area	Bench Quick Disconnect	Not	S
Manual Press	Packaging in Air clamp	Fixed	S
Auto Press	Regulator	Fixed	M

Leak can be itemized in CFM or in size (S, M, L, XL, XXL, etc)
please note the CFM value associated with each size

For example:

XXLL = 16 CFM
XLL = 14 CFM
LL = 12 CFM
XXXL = 10 CFM
XXL = 8 CFM
XL = 6 CFM
L = 4 CFM

2	L = 4 CFM	**59 Fixed**
10	M = 2 CFM	**7 Not**
54	S = 1 CFM	
66 Leaks (Incidences)		75 CFM Fixed
82 SCFM Total Loss Due to Leaks		7 CFM Not

Calculations:

82 CFM / 1410 CFM = 5.8% of active generation capacity

82 CFM / 855 CFM = 9.6% of average CFM demand

82 CFM / 6 CFM PER kW = 13.67 kWh

5.2 Waste Information Results

Blower Waste Tables

*Blower must be marked off **after inspection** trip as "Fixed Replaced" or "Not"*
Waste can be itemized in CFM or in size (S, M, L, XL, XXL, etc)

Location / Description		Check	Size
Machine # 1	Nozzle @ Bench	Fixed	L
Machine # 2	Nozzle @ Bag Unit	Fixed	L
Machine # 1	Nozzle @ Bench	Fixed	L
Machine # 2	Nozzle @ Bench	Fixed	L
Machine # 1	Nozzle @ Bag Unit	Fixed	L
Machine # 2	Nozzle @ Bench	Fixed	L
Machine # 1	Nozzle @ Bench	Fixed	L
Machine # 2	Nozzle @ Bench	Fixed	L
Machine # 1	Nozzle @ Bag Unit	Fixed	L
Machine # 2	Nozzle @ Bench	Fixed	L

10 L = 4 CFM 0 M = 2 CFM 0 S = 1 CFM	10 Fixed 0 Not	
10 Nozzles (Incidences)		40 CFM Fixed
40 SCFM Total Loss Due to Blow Off		0 CFM Not

Cooling Cabinets Waste Table

Cooling Cabinets must be marked off after inspection trip as "Fixed Removed" or "Not"

Waste can be itemized in CFM or in size (S, M, L, XL, XXL, etc)

Location / Description		Check	Size
Machine # 1	Cabinet @ Machine 1	Fixed	20CFM
Machine # 2	Cabinet @ Machine 2	Fixed	20CFM
Machine # 3	Cabinet @ Machine 3	Fixed	20CFM
Machine # 4	Cabinet @ Machine 4	Fixed	20CFM
		4 Fixed 0 Not	
	0 S = 1 CFM 4 Cooling Cabinets Removed (Incidences) 40 SCFM Total Loss Due to Cabinets		80 CFM Fixed 0 CFM Not

Pressure Reduction Waste Table

Pressure Reduction must be marked off after inspection trip as "Fixed Reduced" or "Not"

Waste can be itemized in CFM or in size (S, M, L, XL, XXL, etc)

Location / Description		Check	Size
System # 1	100 to 85 PSIG @ 1%/2PSIG Savings, 7.5%	Fixed	48,000 kWh
System # 2	100 to 85 PSIG @ 1%/2PSIG Savings, 7.5%	Fixed	48,000 kWh
		2 Fixed 0 Not	96,000 kWh Reduced 0 kWh Not
	2 Systems Reduced (Incidences)		

Insert a Proposed pressure drop diagram *Please describe pressure drop issues with all system components and include savings opportunities including average pressure reduction savings.*

Note: If equipment needs to be purchased which will make the payback more than one year, do not include in this section. Include any improvements that requires more than one year payback in the Potential Rebated Projects section.

5.3 Monitor Equipment Description

The measuring equipment used in this survey were <*Equipment description*>. Meters calibrated for the corresponding pipe size transmitting a 0 to 5 VDC. The signal is then transformed into meaningful data (CFM, PSIG, and Amps) and recorded with a Monarch Instrument paperless recorder memorizing a sampling every 5 seconds. <*Engineering Firm*> then transfers the data onto computer discs and manipulates the data to print data summaries and data details. If in reviewing the data presented in this survey, <*Customer*> would like a further breakdown of the recorded data to view a specific event, <*Engineering Firm*> can and will supply the data as requested. Information concerning the equipment is enclosed.

<*x*> Mass CFM flow probe(s), pressure transducer(s), and recording cube(s) <*was/were_*> installed by <*Engineering Firm*> at predetermined location(s), recording CFM, PSIG, and Amps (upon request) servicing the entire compressed air system. The comparison of the CFM, PSIG, and Amp data with the calculated generation estimated input BHP will provide a good overall snapshot of the system's characteristics, performance, and efficiency.

A <*Engineering Firm*> technician used an SDT-101 ultrasonic leak detector to locate and tag, compressed air leaks. These leaks were estimated in size from small (1 – 2 CFM) to large (12+ CFM).

5.4 Recommendations
Please provide calculations for savings and payback in section 6.1 and 6.2

5.4a Recommendations for Waste and Leaks (Immediate fixes)
Describe savings and payback after each item or summarize total savings and payback at the bottom of this section.

1. Repair all tagged leaks and initiate a compressed air leak detection program. A good semi-annual/annual leak detection program could prove valuable and cost effective.
2. Waste Issues repairs. Put NA in after item if none were found.
    - Waste #1 Blowers
    - Waste #2 Cabinet Coolers
    - Waste #3 Reduce pressure drop
    - Waste #4 Other Unknown
    - Waste #5 Add as needed - NA

5.4b Recommendations for Custom Solutions (Need pre-approval through Xcel Energy)
Describe savings and payback after each item or summarize total savings and payback at the bottom of this section.

1. Consider VFD Trim Compressor to run. The payback would be 4 years with savings of 100,000 kWh.
2. Consider small (<*xx*>/<*xx*> gallon) point-of-use metered and regulated air receivers for all the baghouse applications to try to stabilize and minimize their impact on the system. The payback would be 4 years with savings of 80,000 kWh.
3. New piping to link compressors so compressors would run less often- describe savings and payback.
4. New Dryer – describe savings and payback
5. New System storage-- describe savings and payback
6. New electrical equipment to replace air equipment-- describe savings and payback
7. New no loss air drains-- describe savings and payback

6. EXECUTION STEPS

6.1 Estimate of Costs to Repair Leaks and Waste

Less than one year payback

Improvement	Project Cost	Payback Calculation	Energy Savings (kW, kWh)
Leaks	Estimated cost to repair leaks: $20 x 66 = $1,320.	.2 Years	119,300 kWh
Waste # 1	New nozzles $560	.2 Years .1	58,980 kWh
Waste # 2	Remove Cabinets $550	Years .1	115,300 kWh
Waste # 3	Reduce Pressure $450	Years .99	96,000 kWh
Waste # 4	Remove #4 $6000	Year	126,000 kWh
Waste # 5			
Waste # 6			

All values are estimates

6.2 Estimate of Cost and Savings for Improved Efficiency Equipment (Custom Solutions Pre-Approval Required) List individually or by group.

More than one year payback

Improvement	Project Cost	Payback Calculation	Energy Savings (kW, kWh)
Recommendation #1	$30,000	4 years	100,000 kWh, 15 kW
Recommendation #2	$40,000	8 years	100,000 kWh 10 kW
Recommendation #3	$40,000	8 years	100,000 kWh 10 kW
Recommendation #4	$40,000	8 years	100,000 kWh 10 kW
Recommendation #5	$40,000	8 years	100,000 kWh 10 kW
Recommendation #6	$40,000	8 years	100,000 kWh 10 kW
Recommendation #7	$40,000	8 years	100,000 kWh 10 kW

All values are estimates

7. APPENDIX

(Please include all supporting charts and graphs in this section)