Company Overview

• Tape and related products
• Largest 3M tape manufacturing site in the U.S
• 1500 employees
Motivations for Change

- 3M Energy Management program active since 1973
  - Make energy/carbon efficiency a competitive advantage for 3M
  - Reduce environmental impacts
  - On-going cost reduction
  - Maintain positive 3M image
Motivations for Change Cont.

- 3M Hutchinson Energy Team
  - Reduce electrical consumption by 10%
Reasons for MnTAP Assistance

• Energy Team made up of volunteers
• Intern: Focused and Dedicated
  – Researching
  – Planning
  – Implementing
Approach

Collect  Record  Analyze  Identify
Collect information

- Motor Inventory Sheet
- Nameplate and Measured Data

### Motor Data Collection Form (Print)

<table>
<thead>
<tr>
<th>Nameplate Data</th>
<th>Measured Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor ID:</td>
<td>Volts (AB):</td>
</tr>
<tr>
<td>Date:</td>
<td>Volts (BC):</td>
</tr>
<tr>
<td>Motor Location:</td>
<td>Volts (CA):</td>
</tr>
<tr>
<td>Motor Type:</td>
<td>Amps (A):</td>
</tr>
<tr>
<td>Age of Motor:</td>
<td>Amps (B):</td>
</tr>
<tr>
<td>Manufacturer:</td>
<td>Amps (C):</td>
</tr>
<tr>
<td>AC/DC?:</td>
<td>Power Factor:</td>
</tr>
<tr>
<td>Model:</td>
<td>Motor Operating Speed:</td>
</tr>
<tr>
<td>Size (HP):</td>
<td>VFD Installed?:</td>
</tr>
<tr>
<td>Service Factor:</td>
<td>VFD Hz?:</td>
</tr>
<tr>
<td>Frame:</td>
<td>Other Info:</td>
</tr>
<tr>
<td>Enclosure Type:</td>
<td>(Not 3-phase, Not running 24/77, etc.)</td>
</tr>
<tr>
<td>NEMA Design:</td>
<td></td>
</tr>
<tr>
<td>Synch RPM:</td>
<td></td>
</tr>
<tr>
<td>Full Load RPM:</td>
<td></td>
</tr>
<tr>
<td>Voltage Rating:</td>
<td></td>
</tr>
<tr>
<td>Full Load Amps:</td>
<td></td>
</tr>
<tr>
<td>Full Load PF (%):</td>
<td></td>
</tr>
<tr>
<td>Full Load Efficiency (%):</td>
<td></td>
</tr>
<tr>
<td>VVA Code:</td>
<td></td>
</tr>
<tr>
<td>Rewound?:</td>
<td></td>
</tr>
</tbody>
</table>
Record collected data

- Develop a motor inventory
  - No current documentation on motors
- Record all gathered information in an excel spreadsheet
  - Many are familiar with using Excel
  - Many programs can use Excel format
Analyze collected information

• MotorMaster+ 4.0
  – Developed for the U.S. Dept. of Energy by Washington State University

• Energy Management for Motor Driven Systems
  – Office of Industrial Technologies
Identify current opportunities…

• Replace inefficient motors
  – Old motors
  – Oversized motors
  – Require payback within two years
... And future possibilities

- Continue inventorying motors
  - Inventory “caretaker”
  - “Flags”

- Replace belts
  - Cogged belts more efficient than standard
  - Possible noise problems
Future possibilities cont.

• Replace air filters with low pressure drop filters
Successful Process Changes

• 100 motors so far in inventory
• One 40hp motor replaced
  – Savings of over $4,000 a year
• Twelve other opportunities identified
  – Savings of $6,400 a year
  – Less than 2 year payback
• $180,000 saved over lives of motors!
Personal Benefits

• Gained valuable experience working in industry
• Introduced to many working professionals
• Learned skills from knowledgeable advisors
Questions?