Motor Systems Analysis
3M Hutchinson

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Driven to Discover℠

Company Overview

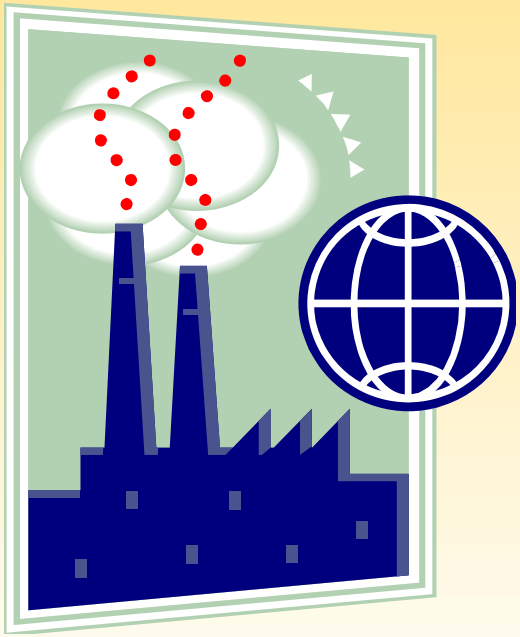
- Tape and related products
- Largest 3M tape manufacturing site in the U.S
- 1500 employees

Motivations for Change

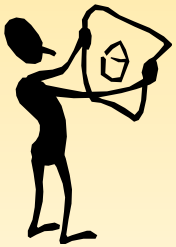
- 3M Energy Management program active since 1973
  - Make energy/carbon efficiency a competitive advantage for 3M
  - Reduce environmental impacts
  - On-going cost reduction
  - Maintain positive 3M image

Motivations for Change Cont.

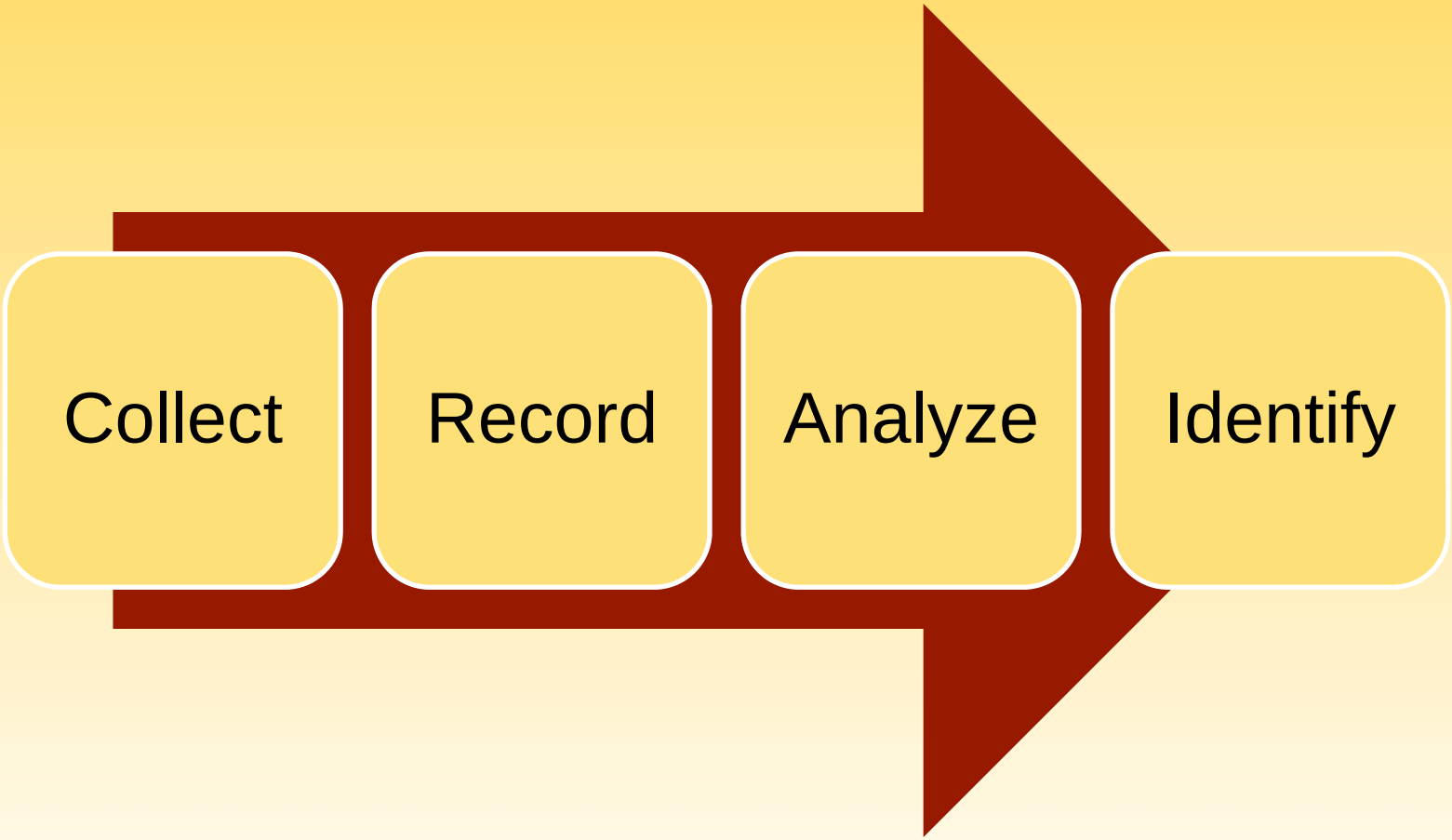
- 3M Hutchinson Energy Team
  - Reduce electrical consumption by 10%



Reasons for MnTAP Assistance

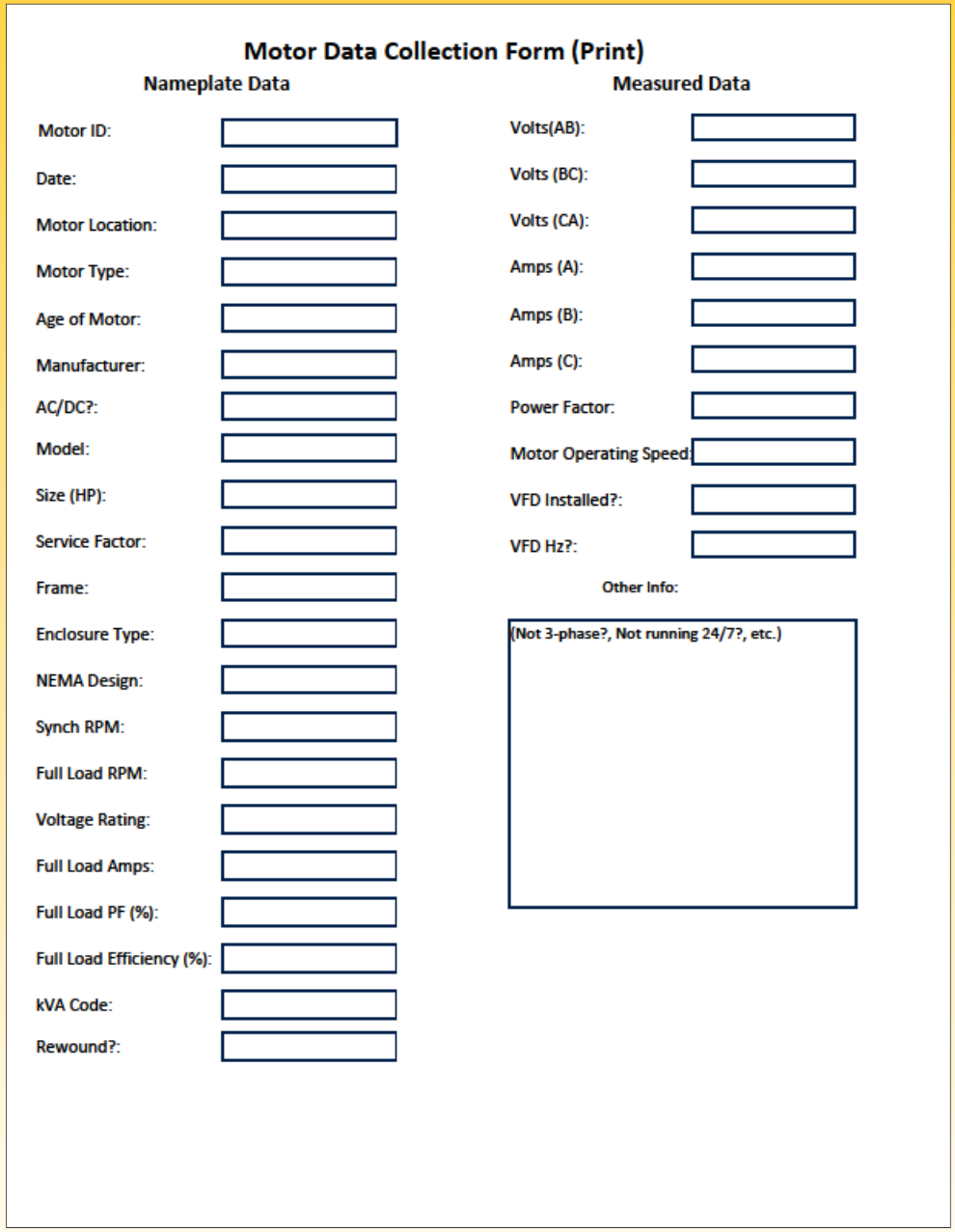
- Energy Team made up of volunteers
- Intern: Focused and Dedicated
  - Researching 
  - Planning 
  - Implementing 

Approach



Collect information

- Motor Inventory Sheet
- Nameplate and Measured Data



Motor Data Collection Form (Print)

Nameplate Data		Measured Data	
Motor ID:		Volts(AB):	
Date:		Volts (BC):	
Motor Location:		Volts (CA):	
Motor Type:		Amps (A):	
Age of Motor:		Amps (B):	
Manufacturer:		Amps (C):	
AC/DC?:		Power Factor:	
Model:		Motor Operating Speed:	
Size (HP):		VFD Installed?:	
Service Factor:		VFD Hz?:	
Frame:		Other Info:	
Enclosure Type:		(Not 3-phase?, Not running 24/7?, etc.)	
NEMA Design:			
Synch RPM:			
Full Load RPM:			
Voltage Rating:			
Full Load Amps:			
Full Load PF (%):			
Full Load Efficiency (%):			
kVA Code:			
Rewound?:			

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

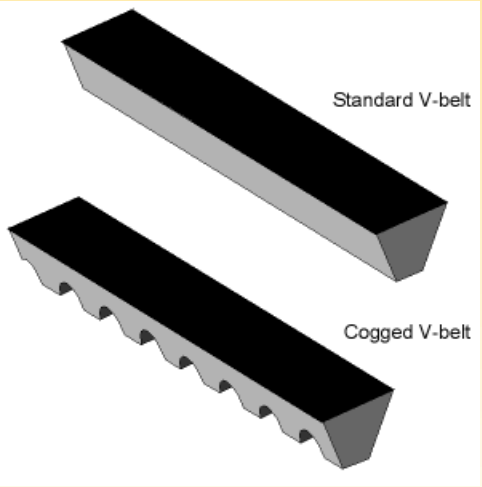
- MotorMaster+ 4.0
  - Developed for the U.S. Dept. of Energy by Washington State University
- Energy Management for Motor Driven Systems
  - Office of Industrial Technologies

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?