

Case Study:

3M Establishes a Company Motor Efficiency Policy

One of the first steps in establishing a company-wide motor efficiency policy is to conduct a survey of motors and motor-driven equipment during a regularly scheduled shutdown period. This approach was implemented with a great deal of success by 3M, which worked with a highly skilled team of on-site engineers, a utility representative engineer, a motor specialist from a major motor manufacturer and a control system engineer. 3M created a methodology for identifying opportunities to retrofit existing motors with new premium-efficiency motors or variable speed drives. This approach includes:

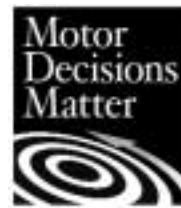
1. Locating and identifying the motors used within the manufacturing plant;
2. Documenting these motor systems, including the manufacturer, type of system, controls, operational requirements, and use (though field measurements).
3. Comparing the need vs. use of the system and how much energy the motor system is using. Proper sizing is critical.
4. Developing options for upgrading/replacing the motor, including the estimated savings, the cost to implement and feasibility of the project (both financial and operational).
5. Preparing feasible strategy reports (describing the system and the opportunities for improvements/savings) and presenting them to the plant management for consideration.
6. Monitoring the upgraded systems, comparing actual savings to calculated savings and documenting these results.

For More Information, Contact:

Southern California Edison Representative: (800) 736-4777

CEE's Premium-Efficiency Motors Initiative:

www.cee1.org/ind/motrs/motrs-main.php3



Motor Decisions Matter Campaign: www.motorsmatter.org

DOE's BestPractices Clearinghouse: (800) 862-2086

www.oit.doe.gov/bestpractices/motors/

NEMA Premium™: (703) 841-3274

www.nema.org/premiummotors

SAVING MONEY WITH MOTORS

in Pharmaceutical Plants

Paving the Way to Greater Profitability

Rising energy costs are making heroes of companies that are energy efficient. This is especially true for companies that require a lot of electricity. Energy efficiency not only helps these companies survive, it can also pave the way to greater profitability.

Improving motor system efficiency is especially important for pharmaceutical companies because motors typically consume 70 percent of their electricity. During a recent period of economic growth most plants added capacity, including motor-driven machines and equipment, making motor efficiency a prime opportunity now.

This brochure explains how plant managers and engineers can help cut electric bills by choosing more energy-efficient motors and managing them wisely.

Below are some specific steps you can take today to achieve similar savings:

- Ask for NEMA Premium™ efficiency the next time you buy (or repair) a motor.
- Plan ahead by establishing a policy that determines when it is most economical to repair or replace critical motors. Share that policy with vendors and repair shops.
- Ask your SCE account representative whether it makes sense to replace inefficient motors before they fail.

An Educational Publication for the Pharmaceutical Industry
brought to you by Southern California Edison



California's Pharmaceutical Industry

Pharmaceutical preparation is one of the most profitable segments of the chemicals industry. Because of the high demand for pharmaceuticals in a variety of consumer products, continued growth is expected.

The 76 pharmaceutical manufacturing companies in southern California are important to the state's economy, contributing annual sales of \$409 million. Their annual electrical bill averages \$203,000.

More than 80 percent of this electricity is used to power motors that stir, agitate, compress, and pump liquids around the plant. Motors are also used to transport raw materials. These motor energy costs represent an important variable expense that can be controlled and reduced through energy efficiency.

Motor Efficiency Makes Sense No Matter Whom You Talk To...

Operations. Premium-efficiency motors (such as NEMA Premium™) can increase productivity by reducing downtime for machine repairs. Higher-grade materials and better design mean less wear and tear on the motor workings, allowing them to maintain peak efficiency over a broader range of loads than standard-efficiency motors.

Finance. Higher motor efficiency saves money on electric bills. The annual energy costs for a standard-efficiency motor can be five times greater than the price of a new motor.

Management. It makes sense to develop a company motor policy that addresses motor procurement and replacement of failed motors. Such a policy ensures that the most cost-effective decisions are being made quickly. This boosts profitability and competitiveness.

Motor Efficiency Measures

In today's business environment, the leanest, most efficient companies are the most likely to go the distance. Below are some quick measures to take in order to help improve motor efficiency in your plant.

- **Replace** standard-efficiency motors greater than 1.5 horsepower that run more than 6,000 hours per year with energy-efficient motors (most are between 2-5 percent more efficient).
- **Adjust** the sheave and speed of the impeller components of the device attached to the motor (e.g., the stirrer and pump) to better match the desired outflow.

- **Install** Variable Speed Drives (VSDs) on pumps instead of valves; this optimizes the flow of the liquid being pumped with the system needs.
- **Install** VSDs on fans previously controlled by dampers; this controls airflow more efficiently.
- **Add** sensors (such as a differential static pressure sensor) to control ventilation levels in various plant areas (such as a clean room).

Developing a Motor Management Plan

There is never a good time for a motor to fail. But they do fail and when one does, you want to solve the problem as quickly and effectively as possible. Choosing a less efficient motor can be costly, resulting in higher operational costs, poor equipment performance and unreliable service. These consequences could be avoided by planning ahead.

Developing a motor management plan is a good way to prevent hasty decisions when motors fail. Typically, these motor replacement policies include:

- **Specifications** for the premium-efficiency motor to be used as a replacement for each existing motor when it fails (or only critical motors). As a member of the Consortium for Energy Efficiency (CEE), Southern California Edison endorses the NEMA Premium™ specifications. These efficiency levels were developed by CEE and the National Electrical Manufacturers Association (NEMA).
- **Advance Purchasing Arrangements** with motor suppliers of high-efficiency motor types, including models and sizes that will be needed. Local motor dealers can inventory these motors and guarantee delivery for rapid replacement of failed motors in the future.

Be Ready for Motor Failure

For more information call your Southern California Edison account representative about developing a motor management plan for your facility today.

Ask about:

- Purchasing NEMA Premium™ efficiency motors
- Developing a written set of criteria for all your repair/replace decisions
- Listing motor inventory (including spares)
- Making repair/replace decisions for your motors, especially those in critical applications.
- Tuning up motor systems

Variable Speed Drives at Genentech

Genentech, a leading pharmaceutical manufacturing company in Vacaville, Calif., replaced the inlet vanes of its six variable volume air handlers (including one servicing the clean room) with VSDs. This decreased the horsepower necessary for airflow reduction. To increase airflow with the inlet vanes, the pressure drop was increased while the fans were running at full speed. These VSDs account for annual energy savings of about \$23,000 and reduce peak load by approximately 40 kW.

**NEMA
Premium**