Billions Squandered Annually Due To Poor Motor Sizing

WEG Electric Motors Corp. [1] has the expertise to explain how proper motor sizing could easily save ample amounts of energy. According to the company, engineers oversizing electric pump motors is commonplace and results in energy efficiency losses. If the motor specification far exceeds the application, it could be costing industry billions of dollars in wasted energy.

"Industry figures suggest that around 80 percent of pump motors could be the incorrect size," comments Andrew Glover, WEG Motors product manager. "The majority are overspecified by as much as 10 or 15 percent by engineers wanting to be 'on the safe side.' As pumps typically account for around 30 percent of an industrial country's energy usage, this represents a serious loss of energy.

"This doesn't even take into account the extra cost of a larger motor with all the associated equipment, drives, cabling, etc." continues Glover. "Electric motor manufacturers are forever striving to increase energy efficiency by 1 or 2 percentage points, but incorrect specification by an application engineer can mean that is wasted effort.

"Where a single percentage point increase in energy efficiency can save the equivalent of the purchase price of an electric motor over its design life, it seems ludicrous to waste energy through poor specification."

Undersizing is also relatively common and should not be ignored. An electric motor can operate above its rated output, thus allowing for temporary overloads. However, such a motor runs hotter as a result, and overheating can cause damage or otherwise shorten its useful life.

This can directly affect motor life through the bearings in two ways-motor reliability and coil insulation. Overheating degrades the insulation more rapidly and encourages discharges that further degrade the insulation, thus shortening the motor's life.

Specification of motor size should, therefore, include starting condition as well as running torque. Method of starting is also important; according to WEG, direct online starting methods can create high torque, which also imposes mechanical stresses on the pump and hydraulic components, while star delta starting delivers lower torque and current.

The company believes that including a variable-speed drive or soft starter in the system specification (matched to the requirements of the motor and pump) can easily overcome these problems.

Variable-speed drives also improve energy efficiency in the long term by matching application requirements with the correct motor speed, thus avoiding energy wasted by belt drives, clutches and gears, for example.

Links:
[1] http://www.weg.net/