Woodgrain Millwork - Progress Revisited: The Savings Continue to Accrue

In 2001, Windings highlighted motor efficiency work done by Woodgrain Millwork in Fruitland, Idaho. Electric Motor Management (EMM) field consultant, Dennis Bowns, had just introduced new ways to promote motor efficiency to Woodgrain's Plant Maintenance Manager, Mark Rawlings. At that time, by factoring the cost of electricity into repair/replace decisions, the company determined that purchasing a new motor, rather than repairing the old one, would improve performance, saving about $600 annually on just the one motor in question. But that was only one benefit of the program's methods. Woodgrain instituted motor efficiency efforts across the board and has continued to reap the promised rewards of saving time, energy and money.

Rawlings was a convert to the EMM methods of: 1) creating a database of the company's estimated 500 motors, 2) using the database to calculate motor operating costs for consideration in repair/replace decision-making, and 3) ensuring the Motor Repair Purchasing Specification (MRPS) requirements were used in all motor repair situations, including several specialty motors custom-made for unique processes. The company embarked on an effort to database its entire fleet of motors. Both motors in operation and those idled in inventory were accounted for, ready for use if needed as appropriate for a switch. When motors were repaired, they were returned with MRPS requirements fulfilled and gauged to best use.

So what has been happening since these efforts began? A lot. First, the vast majority of the 500-motor fleet has been inventoried and entered into the company's motors database. Woodgrain has used em2, a motor data collection and efficiency analysis software tool (www.drivesandmotors.com). Those not yet entered run infrequently and are not operations-critical, but will be added to the database as any failures occur. The result is that spare motors are available almost immediately, shortening downtime by eliminating manpower-intensive research on motors. As any industrial company knows, downtime for essential-operation motors can be incredibly costly.

Another benefit is that, prior to using em2 software to calculate motor operating costs, Woodgrain applied the rule of thumb that motors below 50 Hp were replaced and those above were repaired. With almost the entire population of motors in the database, the cost calculations are readily available, allowing Woodgrain to phase out old rules of thumb in favor of decisions that are realistic and inclusive, based on a comparison of replacement and repair costs, available utility incentives and operating costs.

There are numerous examples where Rawlings found that for motors previously falling under the "repair" category – that is, above 50 Hp – it was more cost-efficient to replace them. In one case, replacement was made for a 250 Hp motor. This motor ran 7200 hours per year. The annual savings achieved by using a NEMA premium efficiency motor will be $2,042 per year, with the cost differential between repair and replace only $700.

When a motor fails now, costs of purchase, repair and power usage all come into play when evaluating each situation. Woodgrain will ultimately have premium efficiency motors for the majority of its motor fleet, including critical spares.

Note the results with even more motors that would have previously been classified as repair versus replace candidates under the old rule of thumb:

Motor Size	Avg. Efficiency Ratings	Annual kWh Usage	Annual Costs
3 **old** 200 Hp Motors	92%	3,465,291	$155,937
3 **new** efficiency 200 Hp Motors	96.2%	3,350,022	$150,750
SAVINGS		**115,269**	**$5,187**

Simple payback time for these replacements was 16 months.

Motor Size	Avg. Efficiency Ratings	Annual kWh Usage	Annual Costs
2 **old** 150 Hp Motors	93%	1,880,641	$84,629
2 **new** efficiency 150 Hp Motors	95.8%	1,827,076	$82,218
SAVINGS		**53,565**	**$2,411**

Simple payback time for these replacements was 12 months.

Motor Size	Avg. Efficiency Ratings	Annual kWh Usage	Annual Costs
2 **old** 75 Hp Motors	90%	375,984	$16,920
2 **new** efficiency 75 Hp Motors	93.6%	361,524	$16,268
SAVINGS		**14,460**	**$652**

Simple payback time for these replacements was 18.5 months.

The change out of these seven motors yields annual savings of $8,250. Woodgrain has over 500 motors and, while the examples highlighted are on the larger side, seven motors represents less than 1.5% of the total motor population. By getting an effective means monitoring motor use and motor costs, Woodgrain has brought incremental savings to daily operational procedures.

Yet another advantage of having an up-to-date motor database is that the costs associated with repair/replace decisions can be presented clearly and objectively to management. Numbers make engineers and management more amenable to investment in efficiency measures. As Rawlings notes, "With numbers, they believe you."

Bottom line? With the various changeouts needed to date, Woodgrain Millwork has achieved an overall energy savings of over $8,250 per year – not even taking into account downtime and research man-hours. The company has saved time, energy, money and headache – all by making the effort to institute the best methods available for a solid and reliable motor replacement program.

Electric Motor Management is a Drive Power Initiative.

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