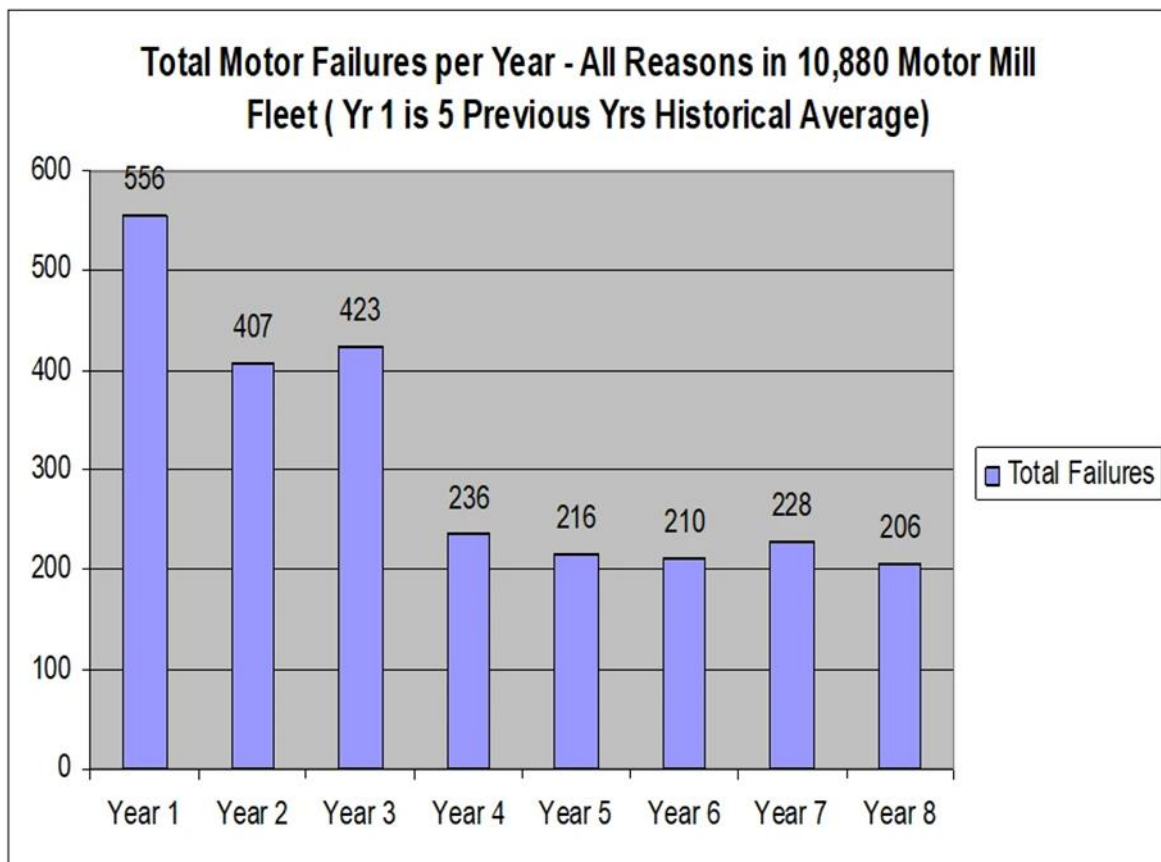


## RULE OF THUMB IS

### Lower Vibration by 20% and Double the Life of Bearings!

Reducing vibration, no doubt reduces fatigue and failure, as proven by Dr. Wernher von Braun and leading reliability engineering schools, therefore increasing a component's life span. However, 80 to 90 percent of maintenance professionals pay little to no attention to this initially. Yet, it's the easiest path to lower costs, improved uptime and improved morale. Keeping an eye on precision through vibration reduction has a lasting effect on numerous mechanisms that play a large role in a company's success.

**Figure 1** shows actual results obtained by implementing and insisting on precision installation and maintenance at the world's largest pulp and paper mill



**Figure 1: Results from precision installation and maintenance**

Prior to precision state, the average life of the mill's motors was 19.6 years. Concentrating efforts on the troublesome and costly motor positions first, and insisting that the hundreds of others vibrating at higher than the newly established minimum acceptable levels be put into a "precision state," easily more than doubled the life of the electric motors to an average life of 46.1 years, or conversely, cut the failure rate in half in just four years. Some eight years later, the rate has been sustained and now reflects an even higher average motor life of 52.8 years.

1. Identify the Top 10 vibrators in each area. Assign the responsibility of putting them in precision state to individual mechanics. Review with each mechanic the proper expectation setting of what the precision state is and how to get it without spending more than a few hours of mechanical downtime.
2. Some plants make the mistake of only working on the Top 10. This is a huge mistake.
3. Set expectations for crew leads to put an additional number of equipment in a precise state each month or quarter. Audit the results (i.e., no pencils or keyboards "whipping up the number").
4. Mechanics with set precision expectations can eliminate common assembly errors made every day in every plant by mechanics and construction workers.
5. Work to establish **strict** precision measurements for fit and tolerance in plant repair shops. Conduct an audit with the mechanics and one engineer outside the repair shops to ensure the mechanics are working to your standards and not theirs, unless their standards are better.
6. All installations in the field must have zero pipe strain, no soft foot and be aligned for thermal growth and precision alignment expectations.
7. New and rebuilt rotating equipment should be purchased to G 1.0 balance specs.
8. It is vitally important for mechanics to fill out and turn in to the planner a precision field maintenance worksheet stating whether or not the equipment was left in a precision state. No one should be scolded if the equipment is not left in a precision state. Mechanics simply need to make notes on why they weren't able to do so. (i.e., pipe strain; no time to correct; bearing housing wore out and none in storage, need to order bearing housing; or precision alignment not possible because 60-year-old base corroded away).
9. Follow-up is also of vital importance. Follow-up on all the problems turned in by mechanics and those on the first line of emergencies. It is vital for the planner, superintendent, or whoever knows they have the responsibility to order parts and get back on schedule for repair.

It has been proven that vibration significantly decreases the overall life of all rotating equipment, including, but not limited to, bearings. Lowering the overall vibration of your plant's equipment will cut your rotating equipment and overall maintenance cost dramatically, while increasing uptime and profits.



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