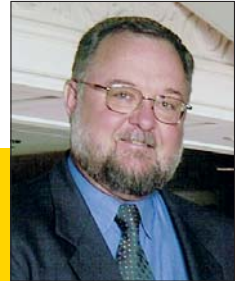


Machine Matters is designed to help readers get the most from excavators, backhoes, skid-steers and other mechanical equipment through proper maintenance, operation and financial practices. Readers are welcome to submit ideas for this column and can send them to Ted J. Rulseh, editor, by calling 800/257-7222 or e-mailing editor@onsiteinstaller.com.

Six Steps to Lower Maintenance Costs

An expert explains how a scientific approach to managing your equipment service and repair expenses can put more money in your pocket

By Greg Northcutt



Preston Ingalls

Preston Ingalls' business is reducing equipment expenses by helping clients keep uptime high, keep maintenance costs low, and extend machines' useful life.

He's president and chief operating officer of TBR Strategies LLC, a maintenance and reliability consulting firm in Raleigh, N.C. The firm's clients around the world include those in the oil and gas, mining, manufacturing, aerospace and construction industries with annual revenues ranging from several million to several hundred billion dollars.

Ingalls and six other consultants work with and train equipment operators, mechanics and maintenance supervisors in developing more cost-effective maintenance programs. As a result, his

the same," Ingalls says. And so, although he deals with big companies, his advice applies to onsite installation contractors, too. Here is a closer look at the cost-saving principles and how to apply them to your business.

1. Keep a sharp eye on expenses.

That requires accurate, detailed and up-to-the-minute records. Whether you use a computer or paper and pencil, it's critical to track maintenance costs. "You can't control what you don't know," Ingalls says. "Good records help you make good decisions. You should be able to determine in a short time how much you've spent on labor, parts and supplies for any machine since you've owned it — and be able to tell which machine is

gram, like Access or Excel, is an alternative. Such a program can do many of the same functions as a CMMS. "However, if you can find a CMMS with a dedicated database designed by someone with a maintenance background, it will be more robust," Ingalls says.

Ideally, any computerized record-keeping system should be able to connect with an accounting system. That way, you can use the information to determine overhead costs and to establish appropriate rates for your equipment charges. Of course, you can also record your expenses and schedule maintenance by hand — it just takes more time and effort.

2. Practice good preventive maintenance.

The single most important component of maintenance is inspection. "That involves knowing what you're looking for and ensuring that your equipment is within the manufacturer's specifications," Ingalls says. "For example, is the bucket or belt in the proper condition?"

Besides describing the correct specifications for various equipment components, you can use your owner's manual to create a preventive maintenance schedule. Ingalls advises basing your PM program on operating hours, rather than the calendar. The problem with servicing a machine every so many months is that the amount of

time you use it can vary. Servicing an item every 30 days, for example, may mean you're over- or under-servicing it based on actual hours.

"Also, review the results of preventive maintenance checks periodically," Ingalls says. "You may find that you need to decrease the service interval, or that you can extend it, based on the condition of the service item."

3. Train your service and repair personnel.

Carrying a toolbox doesn't necessarily ensure that your mechanic has the skills to maintain your equipment properly. "Trial and error can be a very expensive way to learn how to do that," Ingalls says. He recommends using qualified mechanics who are trained in the correct procedures and practices needed to minimize downtime and the associated costs.

4. Train your operators.

Because they work directly with the equipment daily, operators are in an ideal position to identify problems and make minor repairs and adjustments. "Make sure your operators assume responsibility for their equipment and are properly trained in making daily and weekly checks and care for their machine," Ingalls says.

Equipment manufacturers offer training for maintenance supervisors and mechanics. They, in turn,

"Running any size fleet is a science — not an art. If you treat it as a science, much is added to the bottom line. If you treat it as an art, someone else gets your profits. The choice is yours."

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clients reduce maintenance costs 25 percent to 50 percent or more. One construction client reduced maintenance costs by 52 percent with sound asset management practices.

"Whether you operate three or 300 pieces of machinery, the basic principles of minimizing equipment service and repair costs are

costing you the most money."

He suggests using a standalone computerized maintenance management system (CMMS). Besides tracking costs, you can use this tool to schedule preventive maintenance and manage any spare parts inventory.

A spreadsheet computer pro-

can train the operators. An experienced, knowledgeable equipment operator can also help a new operator learn such maintenance tasks as inspection and lubrication. "Memories aren't very accurate, so make sure the operator follows a checklist when doing this servicing, so that nothing gets overlooked," Ingalls advises.

5. Adopt predictive maintenance practices.

Regular lab analysis of engine and hydraulic oil is a good way to head off expensive problems. Normally, it costs \$25 to \$30. "By measuring the types and amounts of metals from worn or damaged engine components and other contaminants in the oil, analysis can indicate any corrective action that's needed," Ingalls says. "It can trigger action to eliminate contamination. Also, the results can help determine if you're changing oil more or less frequently than needed."

6. Spend your equipment dollars wisely.

Buying a machine with a lower price tag may end up costing you more in the long run than a higher-quality, more expensive one that lasts much longer. At the same time, though, it doesn't make economic sense to spend more than warranted to repair a piece of equipment. "Don't spend any more for repairs than the machine's residual value, what you'd get if you sold it today," Ingalls says. "For example, instead of replacing an engine, it may be smarter to apply that money to a new machine with better technology that will last longer."

Measuring success

To gauge how effective your maintenance program is, Ingalls suggests comparing your results to others in terms of a few key reference values:

Maintenance costs/estimated replacement value. This measure shows how much you are paying to keep your equipment running for a year in relation to what it would cost you today to replace it, either with the same equipment of similar age or, if not available, with a new machine. Maintenance costs include

labor, material and overhead, but not fuel or depreciation.

Replacement value is not the same as what you paid for the equipment originally or its current depreciated value. For example, if your maintenance expenses for the past year total \$5,000 for an excavator that would cost you \$45,000 to replace, your maintenance cost/estimated replacement value would be \$5,000 divided by \$45,000 — or 11 percent

You can compare your figure to values reported in a study commissioned by *Construction Equipment* magazine, the Association of Equipment Management Professionals (AEMP) and the Construction Financial Managers Association (CFMA).

- World class (average for all industries surveyed): 2.5 to 3 percent
- Construction industry average: 11.6 percent
- Best in class (construction industry): 3.5 percent.

Preventive maintenance hours/total maintenance hours. Let's say your maintenance costs represent 4 percent of estimated replacement value. Is that enough to maintain your equipment properly? That's where this figure comes in. It shows how much time you spend for preventive maintenance compared to all equipment maintenance needs. Comparison values:

- World class: 60 percent
- Construction industry average: 40 percent
- Best in class: 52 percent.

Emergency repair hours/total maintenance hours. Another way to assess how well you are maintaining equipment is to compare the number of emergency hours (time dedicated to repairs that had to be completed within 24 hours) to total maintenance man-hours per year. The lower this figure, the better your maintenance practices. Comparison values:

- World class: 3 percent
- Construction industry average: 29 percent
- Best in class: 5 percent.

"Running any size fleet is a science — not an art," Ingalls says. "If you treat it as a science, much is added to the bottom line. If you treat it as an art, someone else gets your profits. The choice is yours." ■



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