



“ How do we know if we are spending too much or too little maintaining that equipment? ”

## WRITING IN THE MARGINS: BRINGING ORDER TO MAINTENANCE MANAGEMENT

Fleet equipment is normally the single largest asset for construction companies. If operated and maintained efficiently, the fleet provides quality service and output to meet the needs of customers within reasonable costs. If operated or maintained inefficiently, the quality of service degrades and cost rises. What causes the difference? How do business owners ensure the maximum return on our investment? How do we know if our equipment is maintained well? How do we know if we are spending too much or too little maintaining that equipment?

As business owners, we assume that the people we place in charge of managing those assets will perform those duties in the most effective and cost-efficient manner. However, this may be only an assumption.

Let's examine some ways to see if we are getting the best yields and returns from our equipment. *Return*

*on Capital Employed* (ROCE) is a gauge indicating the efficiency and profitability of the application of a company's capital investments. ROCE is calculated as:

$$ROCE = \frac{EBIT}{\text{Total Assets} - \text{Current Liabilities}}$$

\*EBIT is earnings before interest and tax.

Obviously, ROCE should always be higher than the rate the company borrows at; otherwise, any increase in borrowings will reduce shareholders' returns and earnings. It is a measure of the returns that a company is realizing from its capital, therefore, capital employed. It is calculated as profit before interest and tax, divided by the difference between total assets and current liabilities, and represents the efficiency with which capital is being utilized to generate revenue. When external benchmark numbers are unknown to compare to, the owner can still examine the trend. The fact is, improving maintenance practices

should indicate a positive trend of an increasing ROCE over time.

One common measure to assess whether we are spending too little or too much on maintenance is to look at the ratio of maintenance expenditures as a percent of *Estimated Replacement Value* (ERV) or *Fleet Replacement Value* (FRV). ERV is the cost to replace, in kind, your total fleet. In some cases, it is referred to as the insured value of the equipment. Maintenance expenditures include all maintenance labor, parts and materials and cost of maintenance overhead. It excludes fuel, which is a production consumable.

As the illustration on the next page shows, the industry average of maintenance expenditures as a percent of ERV ranges from 9.3 percent for small fleets (less than \$1 million in value) to 13.1 percent for medium fleets to 11.6 percent for larger fleets (over \$25 million in value). However, *Best in Class* (top 5 percent heavy construction and paving companies) average 5

## Benchmark Data



Industry averages are from a survey conducted by Construction Equipment magazine and Construction Financial Managers Association (CFMA) in April 2005. Best in Class and World Class are from TBR Strategies LLC database.

percent, while *World Class* (regardless of industry) average less than 2.5 percent.

Putting this in perspective, if your company has a fleet replacement value of \$20 million and you are fairly comparable to the industry average, you may be spending about \$2.6 million a year on maintenance. However, if you are closer to *Best in Class*, you are spending \$1 million a year, netting a savings of \$1.6 million to the bottom-line. Better yet, if you have been successful at implementing *World Class* maintenance practices, you should be spending no more than \$500,000 per year maintaining that \$20 million fleet, a net savings of \$2 million per year. Now, examining your current margins, ask yourself, how much more business would you have to run and capitalize to produce that same level of return?

Most see maintenance as merely the function or activity to keep the equipment functional. To a large extent, that is true. The equipment division or shop is charged with enabling operations to do their job in an efficient and cost-productive manner by providing equipment in a reliable state, when needed. Therefore, the equipment division or shop is charged with maximizing production capacity. In actuality, if all they do is "fix things," they may not be doing the right things to ensure that equipment is running well, since fixing things is reactive by nature.

For a variety of reasons, the equipment division or shop may find it difficult to make the necessary improvements because:

- ▶ Many equipment managers were promoted from the trades without formal education in management or maintenance systems, therefore, lacking knowledge as to how to improve.
- ▶ Many companies are family-owned, and gaining consensus on an improvement focus can be difficult.
- ▶ Many companies have numerous long-term employees, who, although loyal, are somewhat resistant to change and complacent in their attitudes toward improvement.
- ▶ Few companies actually track any maintenance performance or costs metrics, Key Performance Indicators (KPIs), to allow them to know what is working and what isn't in order to change.

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## ■ ■ ■ In The Field

- ▶ Equipment management modules from industry enterprise or information management systems are often inadequate for tracking or analyzing.
- ▶ We too readily accept poor equipment condition as a result of the construction environment rather than the lack of systems and skills.

Maintenance relies on superior leadership providing direction, focus and support. This almost always means changing the status quo rather than preserving it. This requires ownership to establish a clear mission and a vision supportive of the organization's direction and goals. But, to do this, operations must, in turn, accept some responsibility to maintain their equipment. Only senior leadership can make that happen. Leadership, in this case, is not confined to the maintenance or fleet manager. It includes the owners of the enterprise to provide visible and

focused support for improving equipment system efficiencies. This means, you, as an owner, have a responsibility to provide leadership to drive change.

Leadership is also responsible for establishing the policies and expectations that serve to guide maintenance and the organization in supporting maintenance activities. Once policies are developed, they must be deployed, communicated and monitored. Policies are the "law" of the organization, and are therefore, the foundation to what we hold dear and expect. We know that unposted speed limits leave much to interpretation, which is why we have those little "policy reminders" posted along the side of the road. That is why we clearly communicate rules and expectations.

To move to *World Class* status, you must have certain basic systems and practices in place. Ask your equipment manager or maintenance leader to:

- ▶ Organize a leadership team or

steering council committed to improving maintenance and reliability.

- ▶ Refine the Preventive Maintenance process and incorporate Predictive Maintenance and Condition-Based Monitoring techniques.
- ▶ Focus your attention on a formal operator Basic Care system like Total Process Reliability (TPR) or Total Productive Maintenance (TPM).
- ▶ Place a high degree of emphasis on information management and metrics (KPIs).
- ▶ Focus on developing a defect elimination culture.
- ▶ Formalize planning and scheduling to prepare maintenance activity.
- ▶ Manage inventory control as a science.
- ▶ Focus on skills training for mechanics and operators.
- ▶ Develop clear maintenance policies and procedures that standardize the expectations of the organization.



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## Glossary:

**Condition-based Monitoring (CBM)**—Maintenance activity based on measured condition of an asset with regard to using technology to monitor for early signs of impending failure. Equipment can be monitored using sophisticated instrumentation such as vibration analysis, infrared, etc. Where instrumentation is used, actual engineering limits can be imposed to initiate maintenance activity. Generally, it is real-time monitoring.

**PdM – Predictive Maintenance**—Use of measured engineering parameters against known engineering limits for early detection, analyzing and correcting equipment problems before a failure occurs—this may include oil analysis, thermal testing, ultra-sonic, vibration analysis, electrical signature analysis, etc.

**TPR – Total Process Reliability**—A structured process to improve equipment efficiency and costs by enrolling the entire organization in asset management.

**TPM – Total Productive Maintenance**—A process that builds a close relationship between maintenance and productivity, showing how excellent care and up-keep of equipment results in better productivity. TPM is a philosophy of continuous improvement that creates a sense of ownership in the operator(s) of each piece of equipment as well as in their supervisor.

- ▶ Use Root Cause Failure Analysis (RCFA) to determine causes to failure and develop solutions to prevent a recurrence.
- ▶ Use spreadsheets or other software to calculate Life Cycle Costs to make better repair/replace decisions.
- ▶ Use work orders to track and analyze costs and performance.
- ▶ Be sure to stay the course—strive for continuity, year-after-year.

As an owner, begin the journey to reducing maintenance costs by providing visible leadership, asking critical questions and showing support for equipment improvement. If you are unhappy with the returns from your fleet...do something about it! ■

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