

World-Class Reliability and Maintenance

Differentiators in a Global Marketplace

As emerging markets continue to develop around the globe, the manufacturing landscape continues to evolve. Westernized countries that once dominated manufacturing industries are losing the competitive battle to developing countries. Despite claims of unfair labour practices, less restrictive environmental regulations, and other nefarious factors, plants and factories in developing countries are simply more competitive. Through analysis of benchmarking data, it is clear that reliability and maintenance are the primary drivers. Manufacturing operations in westernized countries accept equipment failures as a cost of doing business while factories in developing countries are focused on failure elimination.

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The fundamental difference in performance between developed and developing markets does not lie in technology – it lies in the culture. After all, preventive and predictive technologies are readily available to all manufacturing worldwide.

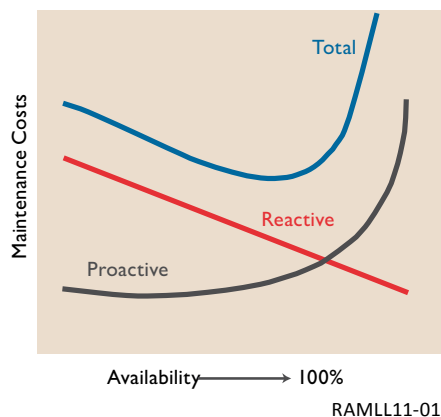


FIGURE 1. Reliability and Maintenance Optimization.

Reliability and maintenance experts in developing countries are exploiting their focus on failure elimination through the use of existing technologies. The evidence is apparent in such metrics as mechanical availability and normalized maintenance costs. Comparison of overall performance between developed and developing markets is striking. First-quartile maintenance cost as a percent of plant replacement value (PRV) in west-

ernized countries has been stuck at $\pm 2\%$ for decades. In contrast, first-quartile performance in developing countries is below 1.5%.

A similar trend can be found for mechanical availability, with some plants in developing countries approaching 99%. The relationship between mechanical availability and maintenance cost can be seen in the graph in **FIGURE 1**.

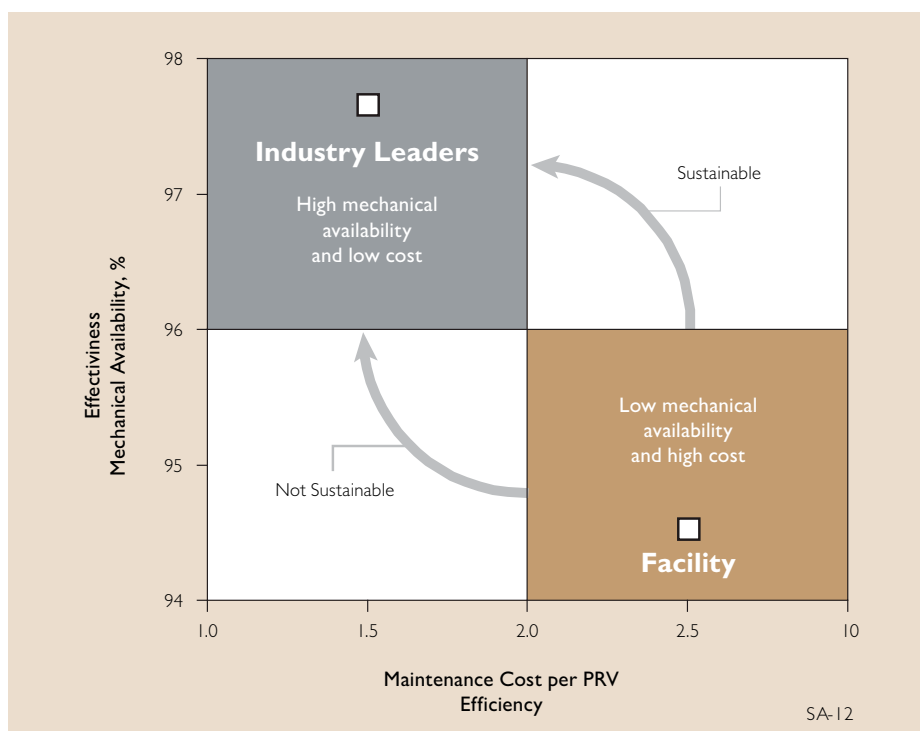


FIGURE 2. The path to sustainable world-class RAM performance.

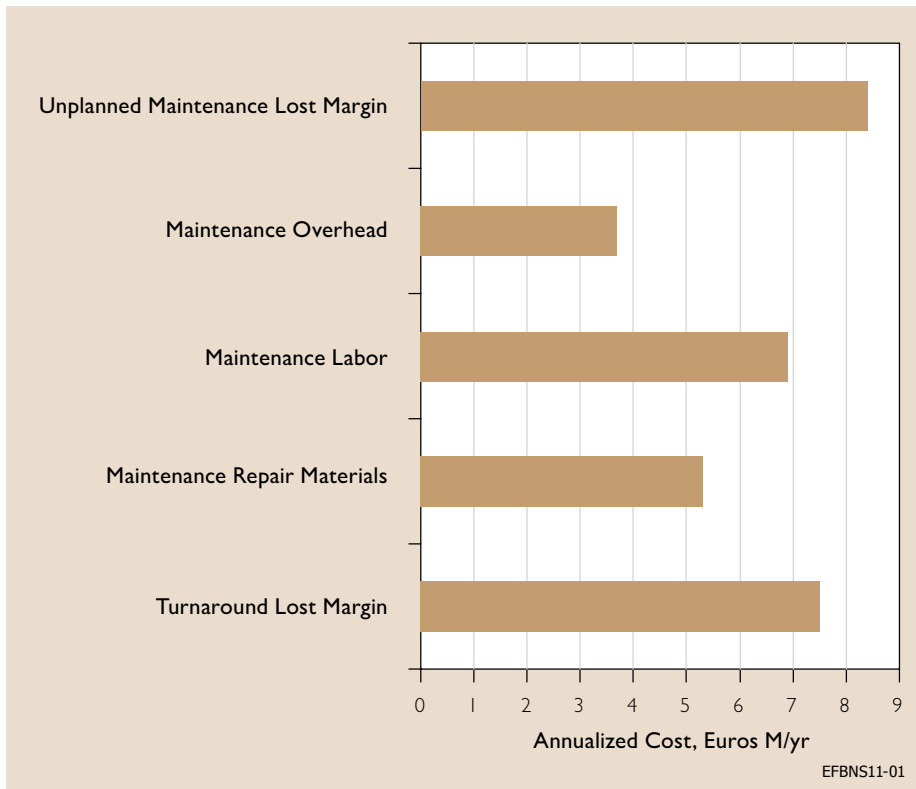


FIGURE 3. Site reliability and maintenance improvement gaps versus best performers.

The adoption of standardized reliability and maintenance key performance indicators (KPIs) has enabled much broader usage of comparative indicators. The work of the European Federation of National Maintenance Societies (EFNMS) participating in the development and publication of standard EN 15341 has had a global impact on how reliability and maintenance is measured and compared. The harmonization of these indicators with the Society for Maintenance and Reliability Professionals (SMRP) metrics has further established these indicators as the standard for the global reliability and maintenance community. We can now measure reliability and maintenance performance and make valid comparisons regardless of the location of the manufacturing operation.

Although already outperforming their western counterparts, manufacturing operations in developing countries continue to get better. Improvement is a case of diminishing returns; consequently there are limits to how good reliability and maintenance can be. This is evident in the marginal difference that separates the top and bottom of first-quartile performers. The bandwidth is tightening as the entire group approaches perfection. The opposite is true with regard to fourth-quartile performers. As best performers get better, worse performers fall further behind. The long-term consequence of

poor reliability and high maintenance cost is a loss of competitiveness. Plants operating with marginal profits or at a loss are unsustainable. Evidence of this can be found in the large number of shuttered factories in westernized countries.

Frustrated executives unfamiliar with the importance of reliability and maintenance demand cost reductions rather than improved reliability. Studies have proven that reliability does not improve as a result of arbitrary maintenance cost reductions. To the contrary, reliability typically decreases as preventive and predictive maintenance programmes are easy targets for unwitting cost cutters. The only path to sustainable first-quartile performance is through improved reliability, as illustrated in FIGURE 2. Benchmarking studies confirm that each 1 % increase in mechanical availability can result in a corresponding 10 % reduction in maintenance costs.

We should not forget the other virtues of good reliability. Plant capacity and throughput increase as less time is lost to unplanned equipment failures. This is the equivalent of getting increased capacity without the expense of a capital expansion. Additionally, product quality increases as consistent quality is derived from uninterrupted operation. With fewer failures, fewer maintenance resources are required. There will be a true need for fewer maintenance craft workers

and staff. The word “true” was added to the previous sentence by design. Maintenance organizations will often follow the ideal gas law – they fill whatever volume they are provided. Consequently, a conscience decision must be made to balance resources with requirements to achieve the aforementioned cost reductions.

The path to first-quartile reliability and maintenance performance begins by identifying gaps when compared to best performers. Performance improvement opportunities can then be prioritized and a performance improvement plan developed and implemented to close the gaps. As the gaps close, reliability improves, with a subsequent increase in margin, and maintenance costs decrease, resulting in a dual revenue benefit. The difference between an organization’s performance and best performers is illustrated in FIGURE 3.

Conclusions

Good reliability and maintenance practices are being recognized as differentiators. Manufacturing managers and executives who once looked at reliability and maintenance as unimportant have come to realize that they are vital to a successful and profitable operation. If you have not come to this conclusion by now, you probably have significant opportunity for improvement. The journey to world-class reliability and maintenance is long and arduous, but it begins with the first step.

The next International Study of Plant Reliability and Maintenance Effectiveness (RAM Study) will be launched later this year, with data input scheduled for first-quarter 2012 using reliability and maintenance data for 2011 or your most recent fiscal year. ■

»WHO is Tom Svantesson?

Tom is a Senior Consultant with Solomon Associates and has his own consultancy, TSMC Production & Maintenance Consultants. He has been recognized as a Certified European Expert in Maintenance Management by EFNMS.

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Al is the RAM Study Project Manager for Solomon Associates and was formerly Technical Director for SMRP.