



Total EXcellence in Manufacturing

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Total Productive Maintenance—a Team Approach to Maintenance

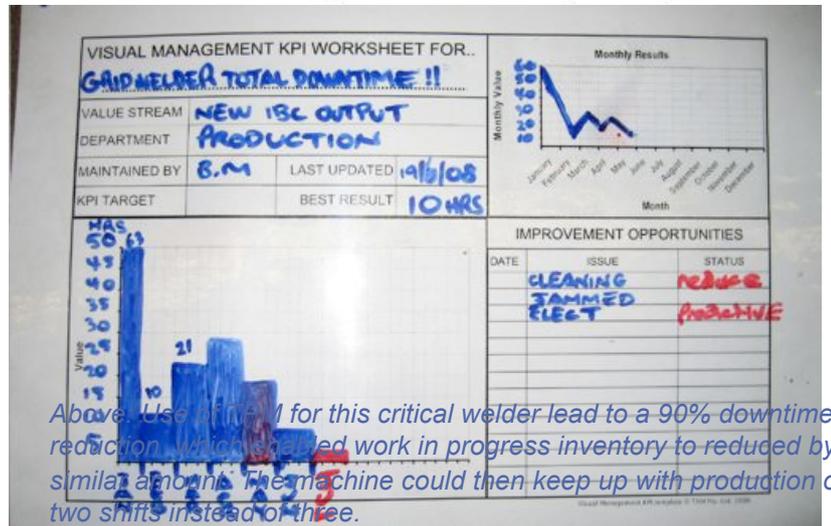
A major cause of instability in manufacturing operations is poor machine reliability. To be able to reliably deliver product to customers on time and at cost, manufacturing businesses need key machines to start up every time. They also need to run consistently at their peak performance. The traditional “reliability” approach to maintenance separates the roles of the maintainer and the operator. The role of maintenance is to provide reliable assets for operations to run. This approach works well for large machines such as electricity generators where there is little day to day human interaction with the machines. It is less effective for machines where operators interact closely with the machines to carry out setups or to adjust settings. Many businesses are still in the mode of reactive maintenance. I call this the “I break, you fix approach” That is, operators run machines until they break and then maintenance fixes them.

The lean approach is called Total Productive Maintenance (TPM). This involves a team effort between maintainers and operators to maximize machine performance, which is measured by Overall Equipment Effectiveness (OEE). OEE considers the three major losses that impact machine effectiveness. These include downtime (the machine is stopped), speed loss (the machine is running at less than its rated speed) and quality loss (the machine is making defects). OEE aligns the efforts of maintenance and operations with a single measure. TXM believes that output should be measured frequently (every hour or every shift). Front line leaders should be coached to solve machine performance problems using structured techniques.

Beyond OEE, the TPM approach involves operators and maintainers jointly caring for machines by making daily checks. This is done by observing the condition of machines, and performing defined clean, tighten, and lubrication tasks.

A “zero tolerance” approach to defects in machinery is encouraged where all defects down to cracked windows and missing screws are tagged and highlighted with a TPM tag. This tag is referred to as a “Yellow Tag” by the JIPM ([Japan Institute of Plant Maintenance](#)). These checks can be built in to a routine daily task list as part of a 5S program and compliance can be checked as part of the 5S audit.

TPM involves a new, collaborative approach to maintenance. Maintainers and operators work together to maximize machine performance. As a result machines work when and how they are supposed to and customers can expect better delivery and quality.



Above: Use of TPM for this critical welder lead to a 90% downtime reduction, which enabled work in progress inventory to be reduced by a similar amount. The machine could then keep up with production on two shifts instead of three.

Its Time to Stop Subsidising the Automotive OEM Industry

Last month the Federal and State Governments announced combined subsidies of at least \$AU70m to support the upgrade of Toyota’s engine plant in Australia. This is on top of over \$35m in subsidies last year for Toyota to build a hybrid Camry in Australia. Toyota is a great company and makes a huge contribution to the economy. It has also lead the lean productivity drive in Australia through its supplier development program. However I would suggest that a profitable private enterprise like Toyota Australia would invest in a new engine plant because it is the right thing for their business, not because they received a government subsidy.

The key question that does not seem to get asked is whether spending millions subsidizing the Auto industry is the best investment the government can make in manufacturing. Imagine if that money was spent on supporting the local commercialization of new technology rather than seeing it go off shore. Or if it was spent on helping local manufacturers improve their efficiency or export their products. Alternatively it could be used to reduce business taxes.

I have recently visited a number of companies in Sydney which are all high value added businesses in medical devices, pharmaceutical, instrumentation, and gaming machines. Most of these businesses are based on locally developed high technology research. Sydney has almost no automotive industry, but dominates those high tech sectors in Australia. Melbourne also some great high tech companies such as Agilent, ANCA and Leica Microsystems. In the Automotive industry we see much of the home-grown innovation is in the aftermarket sector, not OEM. The aftermarket sector is dominated by local manufacturers and local designs and is a growing exporter of products such as four wheel drive accessories. Despite this potential Aftermarket manufacturing receives almost no government support. Meanwhile in OEM, probably the best lean company in Australia, Autoliv is going to shift most of its production to Thailand next year - despite all that Government money. This all leaves me wondering whether we would get more value if all that money that went to Toyota had gone towards supporting the growth of the next Cochlear or the next ANCA, rather an engine plant that probably would have been built anyway.

The Importance of Flow

At the start of October Melbourne hosted the Operational Excellence 2010 conference. This brought together some of Australasia's best manufacturing companies with a range of excellent speakers from Australian and North America. The highlight for me was the talk by US Lean expert, Kevin Duggan. Kevin posed the question, why is flow important in manufacturing and administrative processes.

"Flow" in a lean environment is a process where products or transactions flow smoothly from one process to the next at an even rate with no interruptions. Moving assembly lines are the best example of flow. Most of us know that flowing product from one process to the next without waste is a good thing, but perhaps it is easy to forget why it is good.

Kevin's point was that the achievement of flow is important because it enables us to see where flow stops. The point at which flow stops, due to a quality problem, a material shortage, a breakdown or any number of reasons then becomes the focus of our problem solving efforts. Without flow it is often impossible to see these small and frequent interruptions. Hence, we do not focus on fixing them. Waste then remains hidden and lead times are extended. Kevin defined Operational Excellence as an operation where each and every employee can see the lean flow of value to the customer and fix that flow before it breaks down. Therefore the operation (or value stream) becomes "self healing" with flow as the "immune system".



Above: TXM Features at the Melbourne Cricket Ground, venue of the Operational Excellence 2010 Conference

Lean For Growth

Another key message from Kevin's talk was the theme of using lean to support your business growth. This is consistent with the message in my recent Agile Manufacturing article where I pointed out that using lean for cost reduction is zero sum game. The gains from each round of cost cutting gradually diminish until a lot of effort is required for a very small gain. In addition the labour cost gap between first world and developing economies is so huge that imported unit costs can not be matched. through cost cutting and local suppliers need to compete on total cost considering service, quality and flexibility. This is where Kevin sees lean providing value in the future. Use lean to increase capacity, free up space, release cash from working capital, improve flexibility and, importantly, empower front line employees to run the day to day order fulfillment process. You can then use these freed up resources and management time "to go on the offence" as Kevin calls it and grow the business. Interestingly at TXM we find that our privately owned SME manufacturers already understand this. Overwhelmingly they come to us asking us to improve their manufacturing processes and plant layout to give them capacity to grow. We think big corporations can learn from this and shift their lean focus from defensive cost cutting to offensive -building capacity and capability to support business growth.

TXM News

TXM Team in China Grows

TXM is pleased to announce that we have appointed Robert Mitchell as our Business Manager for China. Robert is based in Shanghai and will co-ordinate the Chinese consulting services and lead our business growth in this exciting market. Robert has almost 20 years of manufacturing experience in a range of technical and leadership roles with Clariant. He has spent the last eight years in China.

TXM at the Operational Excellence 2010 Conference

TXM attended and exhibited at the recent Operational Excellence conference at the Melbourne Cricket Ground. The Operational Excellence conference is organized by SIRF Manufacturing Roundtable, a Manufacturing Best Practice network based in Melbourne. The conference provided a great opportunity for TXM to showcase its services to a new audience. It also gave us the opportunity to see some great speakers including Kevin Duggan who I quote above and Dave Deskur from CGL Manufacturing in Canada who told a compelling story about how his lean business survived the GFC. Well done to Victor Caune and the SIRF team for putting on an excellent conference and we look forward to being back next year.

TXM article on the Cover of "Australian Manufacturing Technology"

TXM Managing Director, Tim McLean is the author of this newsletter and a regular contributor of articles to Australian Manufacturing Technology and other magazines. Tim's latest article in the October edition of AMT builds on the theme of Agile Manufacturing introduced in the January newsletter. The editors of AMT chose Tim's article as its cover feature and the two page article features photos of two of TXM's best "Agile" manufacturers, Sykes Racing and Branach Manufacturing as well as examples from a range of other innovative TXM customers. To read the article follow this link: [AMT Agile Manufacturing Article](#).