

LORIEN ENGINEERING SOLUTIONS – PRESS RELEASE

Document reference: 116_2611

Document alias: Talking Reliability

Article written by Debbie Giggle, for The Manufacturer.

» Talking reliability

Debbie Giggle asks whether TPM is just another acronym or the key to the future?

World-class manufacturing is populated by three letter acronyms so TPM, (total productive maintenance), fits happily into the family. As in human families, however, some offspring are more popular than others. Just-in-time (JIT) could be the sensible eldest son in the world class manufacturing family, while enterprise resource planning (ERP) is the talented wunder-kind. But where does TPM fit in the family tree? Manufacturers and consultants seem to have mixed feelings. There are success stories demonstrating impressive results. There are organisations that have selected key components of TPM and moulded them into different maintenance solutions. There are also those who regard it as 'an acronym too far'. So what is it about TPM that generates these differences of opinion?

One thing on which all manufacturers seem to agree is that improving the reliability of production equipment can have a radical impact on business performance. TPM has its roots in the preventive maintenance procedures developed in the US and has evolved throughout subsequent generations in Japanese industry. The concept is one of productive maintenance involving total participation, and its aims can include zero breakdowns, zero defects, zero speed losses and zero accidents. The outcomes can encompass greater efficiency, increased production capacity, less waste and improved quality. Strangely, manufacturers and consultants also agree on the scale of the benefits. It is not unusual for the real effectiveness of a production line to be increased from a typical level of 40 to 50 per cent up to the TPM goal of 85 per cent or more.

There also seems to be agreement regarding the basic elements of TPM best practice. These include examining the effectiveness of facilities to identify how and where losses occur, for example downtime due to breakdowns, changeovers, loss of quality and minor stoppages. To achieve improvement, people who operate equipment take responsibility for at least some of the maintenance tasks. Other areas of best practice include a systematic approach to all maintenance activities with all staff trained in the relevant skills. TPM also goes beyond this to consider failure causes and maintenance issues during the design, manufacture, installation and commissioning of any production equipment.

The bone of contention appears to be implementation of TPM and its relevance to individual businesses. The approach, the day-to-day operation of TPM practices, the underpinning of the TPM culture, the selection of autonomous

maintenance tasks and the volume of training all appear to be factors on which there can be a considerable difference of opinion. Even those with a vested interest in the implementation of TPM (consultants, facilitators and trainers) express certain reservations. This is not, it appears, a concept that can be lifted off the peg in Japan and fitted onto British manufacturing like a ready-to-wear suit.

An example of a successful implementation of TPM is that at the Arjo Wiggins paper mill in Aberdeen involving consultants WCS International. The A4 line at the finishing end of the business was chosen for the pilot. This had proved to be a regular bottleneck, so improvement here could both improve output and alleviate the need for a major capital investment in the future. The line produced the Conqueror brand of stationery, and so it was manufacturing a key product with continued long-term demand. There was also a strong and positive willingness on the part of the local A4 work team.

When all unplanned events were taken into consideration, including all door-to-door and supply chain hold-ups, it was identified that the line was running at an average of 35.8 per cent OEE (overall equipment efficiency). Although it was understood that the OEE could in theory be doubled, the company set an initial target of 44 per cent, based on a Best of the Best calculation. The programme started with an intensive four-day hands-on workshop for the A4 teams along with key members of the site's senior management team. After the workshop, five shift-based teams were launched to carry out the nine-step TPM process on all twelve linked elements of equipment on the A4 line. At the same time the teams launched 5S/workplace organisation activities.

Six months later the teams were in control of the equipment related losses, with the management team tackling value stream and supply issues. The initial OEE target of 44 per cent was achieved and a new target of 60 per cent was set. This figure has subsequently been achieved and a roll-out plan has been put in place for other production areas. As a result of the improved efficiency the output and line capacity have been increased with root causes identified.

For Birds Eye Walls in Lowestoft, TPM has become a part of daily operations and the company has developed a feasible on-going method of training newly-appointed manufacturing technicians. Joining forces with Lowestoft College, Birds Eye Walls has established a specialist workshop at the college that is equipped with the relevant food manufacturing plant needed for training. Aspiring technicians are chosen from the production workforce to attend the six-week full time training programme, which underpins the company's TPM procedures.

At a time when manufacturers are lamenting the shortage of trained fitters, the Birds Eye Walls initiative perhaps goes beyond immediate lean manufacturing benefits to address the long-term risk of skills shortages.

It needs to be said however that not all manufacturers and consultants are totally sold on TPM. Some consultants cherry-pick certain aspects of the concept rather than implementing TPM in full. Other organisations have developed their own concepts using TPM principles as a basis.

SM Thacker & Associates, for example, in its paper entitled The Future of

Manufacturing, warns against the dangers of introducing too many initiatives in too tight a timescale. The paper states 'there is a prevailing need for short-term effects, where a manager is viewed as successful or not on the basis of only short term objectives. This creates an environment where the company lurches from one short-term initiative to another, without finishing the first, which leads to rapid deterioration of the initiative and ultimate failure. This often gives rise to cynicism.'

Does the highly-competitive nature of UK manufacturing create the wrong environment in which to implement TPM? Lorien Engineering Solutions has developed its own slightly different methodology for UK manufacturing. The resulting approach, manufacturing reliability (MR) accepts that TPM can be 'hungry' in terms of the time devoted to training of employees. Lorien's approach is to attack all corporate layers simultaneously and utilise short, pointed training sessions with a particular emphasis on root cause analysis.

This approach has achieved impressive results for the bakery company Golden West. The programme involved every member of staff in an engineering, production or management capacity in setting their own key performance indicators to establish improvement targets. Using root cause and criticality analysis the MR programme focused primarily on optimum machine settings with the objectives of generating significant improvement of OEE and reducing waste. Twelve months on, each of five targeted lines on two sites have reached OEE targets of 85 per cent with one 'problem line' now consistently achieving better than 90 per cent OEE. Waste levels are also down to just four per cent. For Golden West the efficiency improvements have increased capacity and enabled the company to add value within the supply chain. Similar activity is now underway at the company's third bakery in Olen, Belgium.

Whatever name we apply to the concept it appears that the method of implementation is the true differentiator and manufacturers are faced with a decision. If TPM fails to deliver, manufacturers risk 'initiative fatigue' at grass roots level, but if there are benefits to be had, companies simply cannot afford to ignore them. TPM has not worked for everyone. So what can we learn from the successful implementations?

Piloting TPM in one bottleneck area is advisable to determine the true commercial benefits. Presenting it as an experiment rather than a panacea may be a more constructive approach.

Measurement of OEE must be a true reflection of performance not a hypothetical and should take into account door-to-door and supply issues. The key performance indicators should be defined and linked to overall strategy, preferably within a larger continuous improvement framework. A sense of urgency is crucial. Many TPM programmes fail because they have inadequate external input, or are given insufficient resources and priority within the company. The nature and volume of training needs to be carefully considered and must be sustainable or TPM will fizzle out over time with changes of personnel. Apply common sense. The business benefits gained by TPM must be worth the additional effort, which is expended by employees. Don't go down the

TPM route simply to 'tick it off the list'.

TPM is not currently seen as the golden boy in the world class manufacturing family. There are other techniques that are easier to get along with, more open and accommodating, more consistent and reliable. Yet there are those who would say don't write it off without understanding its value.