

Far from being a necessary evil, experience shows that Maintenance engagement with a Lean Manufacturing programme accelerates the development of an organisation's Lean capability which is why many forward looking managers are asking.....

What is Lean Maintenance?

This article sets out the role of Maintenance in supporting Lean Manufacturing and how this requires a change in emphasis from a traditional approach to maintenance.

The Operations Director was concerned. The company was making great strides in improving productivity, quality and cost performance yet to the director's eyes, the Lean revolution had bypassed the maintenance function.

Talking to maintainers the Director found that in their view, Lean made their job harder and more stressful. It seemed like the attitude of their maintenance department was holding them back but was this cause or effect? When a problem occurred the problem was fixed but too often it seemed to require a gigantic effort.

Their record keeping was poor, problem solving approach ad hoc and skill levels varied. With so much fire fighting going on, although they were coping, it was obvious that they were not in control and that it was not going to change without a special effort.

A meeting of Maintenance team leaders from across the business highlighted that some areas operated better than others and that the differences seemed to relate as much to outlook and culture as they did to technical difficulties.

The area of the site with the best performance had the closest relationship between production and maintenance. Maintainers were more involved with the business, were shown more respect and in return showed more ownership when things went wrong (which they did less often).



The Director new that each year customer expectations of quality, cost and delivery performance were likely to rise. To compete well they needed to continually raise their game. Out of the two maintenance profiles, the latter approach was what was needed because:

- Lean Manufacturing is not going away;
- Traditional manufacturing (in theory) makes it easier to release equipment. With increasing emphasis on Lean principles time to do planned maintenance will become even more difficult to find;
- Even when time can be made available, with effective planned preventative maintenance, the best you can hope for is that reliability this year will be no worse than last year.
- This will not be good enough to respond to increasing customer expectations so maintenance will need to evolve its methods to meet those predictable new demands.

This is a composite of a number of organisations but it sets out the dilemma faced by many organisations. Lean Manufacturing has revolutionised the way we look at manufacturing but the impact on support functions such as maintenance has not been addressed. Simply overlaying Lean Manufacturing concepts on to the Maintenance ways of working does not help. Under a Lean Manufacturing analysis, almost all Maintenance work is classified as non value adding. What was needed was a fundamental rethink of how maintenance is best carried out in a Lean operation.

Lean Maintenance was developed, in association with the Danish Teknologisk Institut, to help maintenance departments to meet these challenges. From this work the following set of five Lean Maintenance principles have been developed to guide the transition from Traditional to Lean maintenance methods.

The Lean Maintenance Principles

- Develop standard practices to stabilise and extend component/tooling life and reduce quality defects
- Raise those standards to optimise process capability and extend the time between intervention for all personnel
- Manage the transferring of routine maintenance activities to production personnel (Retain control of the quality of maintenance)
- Improve maintenance systems (stores, planning, reporting and analysis) to support continuous improvement of operations performance
- Early Management of projects and shutdowns to secure flawless (Stable) operation start up from day one



Adopting these principles has a profound impact on the maintenance role. The first steps on the Lean Maintenance road map are used to raise reliability and bring technology under control. The following steps shift the emphasis for maintenance from breakdown to quality defect prevention.

The future role of maintenance becomes reducing quality defect levels to counter the cost implications of smaller batch sizes and frequent start ups. In addition to reducing contamination and accelerated component wear, the focus on reducing minor defects also extends the time between interventions. Not just maintenance intervention but also production, quality, hygiene and any other intervention. Some exemplar organisations have achieved run times of longer than a shift without the need for intervention. This provides the business with the option of running additional shifts with a skeleton crew. What would that be worth to your organisation?

Our analysis below shows that the value of improvements realisable within the traditional maintenance asset care silo are around 40% of the total maintenance improvement potential including process optimisation.

Case Study

Value of Lean Maintenance

	Maintenance improvement Potential				£k Total Lean Potential
	£k Improved asset care	£k Process optimisation	£k Impact of maintenance		
Plant 1	£ 108	£ 68	£ 176	44%	£ 404
Plant 2	£ 228	£ 157	£ 385	46%	£ 841
Plant 3	£ 313	£ 692	£ 1,005	43%	£ 2,362
	£ 649 41%	£ 917 59%	£ 1,566	43%	£ 3,607

Maintenance activity delivers a significant % of the potential gains from Lean Manufacturing

From the same analysis, without maintenance involvement only around 60% of the potential benefits of Lean are achieved.

In summary Lean maintenance:

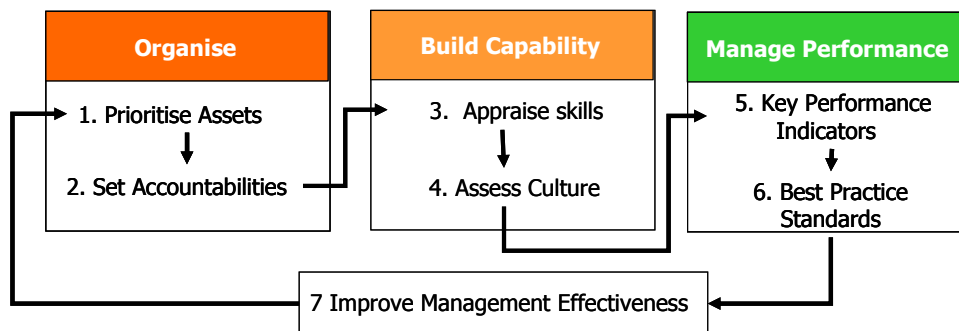
- Is the proactive maintenance role within the Lean Manufacturing never ending improvement process;
- More than doubles the value to the organisation of traditional maintenance improvement programmes;

- Transforms the role of maintenance from fixing breakdowns to quality improvement;
- Raises maintenance standards to first stabilise and then optimise technology performance
- Releases maintainer time from routine activities to focus on long term solutions to technology problems;
- Puts the maintenance function at the heart of Lean Manufacturing improvement process.

Implementing Lean Maintenance

A typical programme begins with an assessment of the strengths and weaknesses of current maintenance practices using the Lean Maintenance Audit. This helps organisations to assess where to improve their maintenance approach to better meet the demands placed on it by Lean concepts such as flow, small batch sizes and frequent set ups. In addition it also helps to identify skill gaps and allocate maintenance resources to the areas which are most critical to the delivery of business improvement goals.

The Lean Maintenance Audit



The output from this audit process is a maintenance improvement programme designed to:

- Stabilise and extend component life, optimise asset performance
- Release the value adding potential of Maintenance;
- Deliver a collaborative, cross functional zero breakdown culture.

If you would like more information about Lean Maintenance and the Lean Maintenance Audit why not attend one of our 3-day Lean Maintenance workshops or contact us for a free site visit to help you to assess the potential of Lean Maintenance to your organisation.

**For further details contact: *DAK Consulting*,
Chiltern House, 45 Station Road, Henley on Thames, RG9 1AT, UK
+44 (0)1491 845504, info@dakconsulting.co.uk**