9 WHAT'S MISSING FROM YOUR LEAN INITIATIVE? TPM'S INTEGRAL ROLE, WITH 5 TAKEAWAYS TO GUIDE YOUR STRATEGY.

A WHITE PAPER BY PRODUCTIVITY

WHAT'S MISSING FROM YOUR LEAN INITIATIVE? TPM'S INTEGRAL ROLE, WITH 5 TAKEAWAYS TO GUIDE YOUR STRATEGY.

Productivity, Inc.

Most business owners and general managers recognize just how critically important proper equipment maintenance is, particularly in an asset-oriented work environment.

Simply put, poorly maintained equipment leads to production downtime, lost revenue, dissatisfied customers, and low morale. Yet, in the context of lean initiatives, debates crop up regarding the role of preventive and predictive maintenance versus Total Productive Maintenance (TPM). Are preventive and predictive maintenance tactics sufficient? Isn't TPM a separate initiative, a secondary consideration, or just plain extraneous to a primary lean implementation? Or, should lean and TPM be interconnected?

In too many companies, equipment initiatives stop with preventive and predictive maintenance. TPM is a capability built on total asset reliability—and total employee involvement. More than traditional preventive maintenance, it is a systematic, data-driven process that fosters an efficient partnership between production, maintenance, and engineering, and that engages those closest to the work. It results in an organization's ability to transition from reactive to proactive maintenance and to create low cost, even free capacity.

More importantly, TPM has a dramatic impact on your organizational culture, overall operations— and your bottom line. It frees up valuable production capacity without the drain of capital investment. The direct and measureable results are better performance, increased capacity, improved quality, decreased scrap and waste, and increased reliability and efficiency. Without TPM, achieving lean flow is not possible; therefore TPM should be an integral part of any lean transformation.

THE ORIGINS OF TPM

As companies with TQM programs kept raising the production bar, equipment reliability was seen as the key to efficiency and productivity

TPM evolved as an offshoot of Total Quality Management (TQM), when the problems of plant maintenance were examined as a part of TQM programs.

At the time, preventive maintenance (PM) had been considered the major component of a traditional maintenance program. In attempts to improve production, maintenance schedules designed to keep machines operational were often revved up to the point of over-servicing. Yet, there was little or no involvement of the machine operator in the maintenance program, and maintenance personnel had little training beyond the (often inadequate) contents of maintenance manuals.

The need to go further than conventional scheduled maintenance as a method of improving productivity and product quality was quickly recognized by companies who committed to TQM. As they kept raising the production bar, they demanded better and better machine reliability, and began to see reliability as the key to greater efficiency and higher productivity.

TPM IN A NUTSHELL

TPM empowers by enlisting operators to participate in the design, selection, correction, and maintenance of equipment.

In essence, TPM is a strategy that empowers employees by enlisting equipment operators to participate actively in the design, selection, correction, and maintenance of equipment.

The objective: to ensure that every machine or production process is always able to perform its required tasks without interrupting or slowing down defect-free production. Operators share "ownership" for the equipment with which they work.

TPM is viewed as "beginning-to-end maintenance" that is critically important to business success. Downtime for maintenance is scheduled as a part of the manufacturing day and, in some cases, as an integral part of the manufacturing process. It is no longer simply squeezed in whenever there is a break in material flow.

The goal is to hold emergency and unscheduled maintenance to a minimum.

A fair analogy would go something like this:

changing your car's oil regularly is "preventive maintenance".

– Analyzing the oil would be "predictive maintenance".

– Knowing the engine and understanding what keeps it running smoothly would be "autonomous maintenance";

– Performing all of the above is TPM.

WHY TPM?

Equipment is the bloodline of production.

You cannot truly become lean or sustain lean gains without adopting a lean equipment management strategy that fosters and enables continuous machine reliability. Like lean, TPM is not a "program." Rather, it is a step-by-step, systematic, strategic process that aims to achieve at least 90% equipment availability and 95% equipment performance. It involves the entire organization and is the foundation upon which lean is built.

Many managers find this counterintuitive, because they've been taught to believe that the production schedule drives the maintenance schedule. In fact, the opposite is true. Equipment is the bloodline of production. It needs to be kept in a constant state of order rather than being repaired only when needed. Planned downtime costs a company a mere 10% of what it costs for an unplanned breakdown. That can add up to sizeable savings in every plant over the course of a year.

Unfortunately, in many companies TPM is viewed as a separate initiative that is optional in a lean environment. In others, managers haven't yet recognized the symbiotic relationship between lean and TPM, and think they need to choose between the two. But the true objective of the lean/TPM partnership is the implementation of a total process that impacts virtually every aspect of operations and daily work.

IT'S NOT JUST FOR THE MAINTENANCE DEPARTMENT.

Lean and TPM require a vision that is shared by the entire employee community.

Lean and TPM, and the transformation they can achieve together, require a vision that is shared by the entire employee community, one that can be turned into concrete and measurable objectives and that connects to all improvement activities throughout the entire organization.

For example,

- Human Resources plays its part by recognizing the need for more extensive training of employees on equipment monitoring and autonomous maintenance.
- Accounting must appreciate the importance of allocating additional funds for the purchase of the proper equipment and parts.
- Quality department staff must connect directly with the maintenance manager so that both sides grasp the relationship between reliable equipment and a quality product.

And, production personnel learn to take ownership of their equipment, perform autonomous maintenance routines, and participate in the design processes for new equipment.

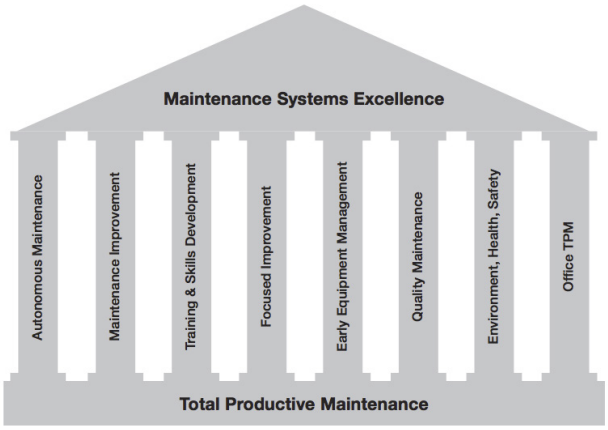
MORE ON THE "TOTAL" IN TPM

TPM creates a shared and proactive responsibility for equipment.

Traditional maintenance puts responsibility to react to problems primarily on the shoulders of the maintenance department. TPM, on the other hand, creates a shared and proactive responsibility for equipment, encouraging greater involvement by plant floor workers. In the right environment this approach can be extremely effective in improving productivity (increasing uptime, reducing cycle times, and eliminating defects).
TPM trains your people—not just your maintenance people but also machine operators and others—to play an active role with equipment.

The 8 Pillars of TPM

Effective TPM comprises a wide range of elements that take an organization way beyond simple preventive or predictive maintenance:



- Through **Early Equipment Management,** team members develop an important understanding of how the design and manufacture of equipment can help make it easier to operate, simpler to maintain, and right-sized for its purpose. The people who operate the equipment are involved in helping to reduce the complexity of real-time operation.
- By understanding the concept of **Maintenance Improvement**, team members evolve from a reactive to a proactive position. They analyze breakdowns to better reveal machine weaknesses. They learn to modify equipment and manage replacement parts to improve operator maintainability. And, they map out a planned maintenance schedules for longer service life.
- The long-term value of committing to a **Comprehensive Training** program ensures that people at all levels have the skills, and just as importantly the awareness, to support TPM effectively.
- The adoption of an **Autonomous Maintenance** program instills an "operatorbased care" philosophy, transferring basic equipment care responsibilities from maintenance staff to equipment operators. This frees up key maintenance employees to handle more specialized activities such as major overhauls, machine upgrades, predictive maintenance, and new equipment planning. At the same time, autonomous maintenance encourages a strong relationship between TPM and the efficiencies of 5S programs.
- A **Quality Maintenance** strategy commits your organization to efforts that ensure equipment is maintained effectively throughout the entire production process. The objective is to eliminate defects—beginning with basic materials and continuing right on through to the finished product. This might include monitoring very specific machine features such as temperature, pressure, flow, and equipment flexibility.
- Finally, TPM enables you to get the most out of your machines by accurately measuring **Overall Equipment Effectiveness**. You'll have the ability to determine the actual contribution of each piece of equipment as a percentage of its potential to add value to your overall operations. There may be no better example of implementing true "productive maintenance."

NEXT STEPS FOR INITIATING OR REVIVING A TPM ROLLOUT

First, make sure you understand the big improvement picture.

Developing a strategy to establish TPM—and integrate it as part of a lean transformation —begins with analyzing and understanding the key areas that need to be improved throughout your operations. That involves establishing revenue goals, performing value stream analysis, creating key lean initiatives, identifying and sharing responsibilities for action items, and laying down milestones and rollout plans.

You may want to begin by asking yourself these fundamental business questions:

– How does your organization make money?

– How does it spend money?

– What drives profits, revenues, and margins?

– Where is the improvement focus?

– How do I get all my employees more actively involved?

The last item may be the most critical. Lean and TPM will have a profound and lasting effect on a company's culture by emphasizing the role of employees in virtually every step of the production and maintenance process. Successful TPM requires a mindset of commitment, an enterprise-wide strategy, recognition of what's at stake, and an end goal of "World Class Status" for your organization.

The initial steps you should consider taking include.

– Committing top management to full support of TPM.

– Generating a detailed implementation plan and roadmap.

– Putting in place Autonomous Maintenance for all operators.

– Adopting a data-driven philosophy.

– Creating a partnership between production, maintenance, and engineering.

– Instituting a "no blame" environment focused on root causes of problems.

KEY TAKEAWAYS

TPM is fundamental to achieving true lean flow.

These five key points capture the high-level view of TPM, what makes it tick, and it's importance for your organization.

1 Total Productive Maintenance impacts your organization's total operational process.

2 It is designed to build and strengthen the capabilities of your people, your processes, and your equipment in order to maximize asset reliability and, ultimately, company profits.

3 TPM cuts deeper than preventive and predictive maintenance routines, works hand in hand with your lean strategy, and is fundamental to achieving true flow.

4 Without the proactive commitment and the everyday involvement of your workforce, TPM (like lean) is unsustainable.

5 TPM transformations yield dramatic improvements in how employees perform their jobs, in the relationship between employees and management, and in their ability to work in teams and react positively to change.

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