

## Total Productive Maintenance: What It Is and What It Is Not

Since I first began studying Total Productive Maintenance in 1986, I have been taken with its powerful capabilities and its simplicity. Over the past 20 years, I have seen more confusion and misinformation about TPM than sustainable results. However, I have also seen that true TPM really works here in America. Here are some insights into what TPM is, what it is not, and what it takes to tap into its power.

Total Productive Maintenance is...

An organization-wide equipment improvement strategy...

Not a maintenance improvement program

A data-based equipment improvement strategy focused on a specific business case for improvement...

Not a program to be implemented

A systematic focus on eliminating the major equipment-related losses...

Not a program to clean and paint machines

A strategy that demands the involvement of anyone who contributes to a problem (engineers, procurement, maintenance, operations, process technicians, quality, storeroom, vendors/manufacturers, trainers, hourly, and management)...

Not merely involving operators in “autonomous maintenance”

A systematic use of proven “TPM tools” to eliminate specific problems...

Not tools to implement in the workplace in the hopes that they get put to good use

An approach that trains and holds workers accountable for proper operations and proper maintenance...

Not “TPM Training” for everyone involved

A major portion of the Toyota Production System from the late 1960s to address major equipment losses (problems)...

Not a recent program dreamed up by Lean and Toyota Production System consultants

A strategy that assures that all critical equipment is reliable by focusing on improving overall equipment effectiveness...

Not a maintenance program applied to all critical equipment

A culture change (evolution) led by top management with very clear business expectations...

Not led by the maintenance or plant engineering organizations

The **only proven work culture** that promotes and sustains reliable equipment at lower costs...

Not one of many options for improving equipment reliability and/or cutting costs

An approach that embodies **all** of the proven maintenance & reliability tools (PM, PdM, RCM, P&S, CMMS...)

Not instead of the proven reliability tools

Is best described in the Basic Pillars of Total Productive Maintenance (underlying principles)

1. Improving equipment effectiveness by targeting the major losses (focused improvement)
2. Involving operators in the routine maintenance of their equipment
3. Improving maintenance efficiency and effectiveness
4. Training to improve skills and knowledge
5. Improving operability and maintainability throughout the equipment life cycle
6. Teamwork and leadership focused on common goals (added by this author)

### **Insights from 20 years of teaching, consulting, observing the evolution of TPM in America**

Historically, TPM has been more often misunderstood than understood. It is mostly misinterpreted as synonymous with autonomous maintenance or operator involvement. If that were the case, TPM would not be “total” productive maintenance but rather operator-performed maintenance (OPM). In our western culture of independence, non-conformance, and fanfare, we tend to look for quick fixes or improvement programs that will give us a gain on our competition or reduce operating costs. We have a history of programs-of-the-month in our industrialized nation. TPM, misinterpreted as it is, filled a perceived improvement-program need. However, the **results** were rarely realized. If they were realized, the results were not necessarily sustainable because TPM was misinterpreted as “tools” to improve maintenance – *the least defined of all modern industrial activities*.

Frustrated corporate executives and plant managers—under pressure to cut costs, improve revenues, and generate profits—often make decisions or send messages that eventually undermine real and sustainable gains from TPM. Often, this is because they operate in a completely different environment than those on the plant floor. Sure, they might have come from the plant floor but that was years ago, when things were done differently, with different tools, technologies, people, and leadership decision making. Further, many executives and corporate decision makers do not have the time to fully comprehend the sources of the plant-floor problems or the likely plant-floor solutions. This leads to reactive improvements more often than strategic improvements and business results.

Over the past 20 years, a fundamental premise of modern manufacturing has often been ignored: ***Reliable equipment, operating at the lowest possible cost is an essential enabler of profits.*** Since equipment and facilities are often the single largest investment, it would make sense that equipment reliability should be as important to the corporations as is health, safety, environmental, and quality. But it rarely is! Companies continue to stress the importance of their quality, safety, and environmental policies. There are clear statements, communicated in many forms. There are clear expectations and accountabilities for adhering to these expectations. Consequences are in place to address non-conformance with these policies. However, when it comes to the single largest investment—equipment and facilities—almost none of these policies, expectations, accountabilities, or consequences exist.

Total Productive Maintenance provided the framework for policies, the structures, the tools, and the results for consistently reliable, low operating cost equipment and facilities during the evolution of the Toyota Production System (TPS). Toyota leadership knew this and behaved accordingly. After 60 years of evolution, the “just-in-time” manufacturing system grew into the Toyota Production System within Toyota and their suppliers. This is where the problem begins

for today's corporate leaders: They see, they analyze, and adopt or adapt the TPS tools they see when they see TPS in action. What they see and become enamored with are the visuals, kanbans, flows, teams, and continuous improvement natures of the Toyota Operations. What they often fail to see is the "TPS journey" from the old ways of doing business on the plant floor to the new and continuously improving ways, generating sustainable business results. Unfortunately, the TPS tools they see are not the "system" that makes TPS work. This phenomenon has been highlighted by founder of the Lean Enterprise Institute James Womack in 2005 and 2006 and was pointed out by Bowen and Spears in their study of TPS (*Harvard Business Review*, "Decoding the DNA of the Toyota Production System," Sept-Oct 1999). This was also pointed out by Shigeo Shingo in his 1980s writings on TPS from an industrial engineer's perspective. The tools you see and read about in TPS are **not** the "system." What you do not see is the system. The system then is the underlying principles that are passionately led by the corporate executives to achieve very specific business goals toward a vision for the future.

Leadership, leading the organization to a "vision" using a defined business strategy and tactical directions through all levels to the plant floor, makes TPM, Lean, and TPM work. These "Lean cultures" and lean tools work well in a Japanese culture, one of conformance, respect, and one that values interdependence. Or they work well in a business where compliance with TPS, Lean, and TPM expectations are a condition of employment and/or continued supplier relationships. TPS, Lean, and TPM will struggle without a strong, compelling business case with clear expectations for very specific results.

Given that understanding, the single biggest challenge facing corporate leaders is this: ***Making the transition from the way we currently operate our business to one that emulates Lean and TPM work cultures.*** This **transition** represents change—the unfreezing of old habits, learning new methods then re-freezing new habits. Corporate America does not have a good track record for making sustainable change in manufacturing. Leadership can learn from previous change initiatives—the activities, methods, and results as well as the pitfalls. Here are some specific suggestions for leading change toward a Total Productive Maintenance work culture:

1. Learn what true TPM is in an **emerging** Lean manufacturing environment.
2. Formulate a TPM Policy and Guiding Principles supported by the Pillars of TPM.
3. Lead. Form TPM Steering Teams at the corporate level and at the targeted plant levels.
4. Develop a TPM Standard Work Process that will embody the TPM Policy & Guiding Principles. Focus on results, not on a program of TPM or Autonomous Maintenance.
5. Manage the TPM development process as if it were a major capital project.
6. Charter TPM Steering Teams to use the TPM Standard Work Process.
7. Begin by addressing the most compelling business case for improving plant or department equipment performance (critical, constraint, high maintenance cost, interruptions to flow, late deliveries, etc.). Stay focused on that area.
8. Measure, analyze, document, and communicate TPM activities and results.
9. Leverage the initial TPM gains and expand TPM to the next most critical business case.

**TPM will lead to world-class levels of equipment performance and reliability at the lowest possible operating costs.** And a TPM work culture can accomplish more with fewer people (an important factor as Baby Boomers begin retiring). Executive leadership must fully understand the concepts, activities, and business case for developing TPM work cultures. Their leadership vision for TPM must be aligned from the very top levels of the organization to the plant floor and

suppliers. TPM will not work without leadership and subsequent teamwork focused on the common goal of *systematically identifying and eliminating the major equipment related losses*.

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