



## Beyond Total Productive Maintenance (TPM)

### Is your facility world class?

#### Plant-Wide and Maintenance Goals:

To be considered world class these days, you have to look well beyond just 100% on-time delivery.

- Maintenance costs < 5% of total sales
- Uptime availability > 90%
- Backlog compliance > 95%
- Work allocation analysis 80/20 rule or better (80% TPM - 20% emergency)
- Autonomous maintenance activities account for at least 25% of Total Productive Maintenance work
- Predictive methods account for 50% or greater resource allocation for maintenance work
- 5S and monthly layered process audits are in effect plant-wide
- 90% or better Overall Equipment Effectiveness
- Spare parts are 90% or greater on time delivery

### Does running at world class status seem lofty or even impossible?

#### Not at all. Get started today!

Through a well planned, 5-day Rapid Improvement Event, an effective TPM and Maintenance Excellence Strategy can help transform your company culture into a world class provider of reliable materials and services. MMTc can enable companies to see their waste in the current maintenance processes and provide proven solutions for rapid improvement. Planned maintenance activities are an opportunity to save time and money. MMTc shows clients how to transform the view of traditional maintenance as a cost burden into a nimble customer and cost focused service provider.



## Bottom Line Facts

- 180 million in annual lost revenue is directly attributed to poor maintenance practices in U.S. manufacturing firms
- Re-establishing your maintenance approach from a “cost-burden-failure” to a “cost-savings-success” typically will gain a minimum of 6 to 1 payback
- Machines that are pro actively maintained general consume 5% to 10% less energy
- Simple autonomous (operator-based maintenance) generally eliminates 50% to 70% of unplanned stoppages
- Inadequate maintenance practices typically waste 20% to 50% of spare part budgets unnecessarily
- Organizations that operate with traditional “run till failure” methods, typically waste over 30% of every dollar spent on maintenance repairs

## QUESTION: WHAT CAN TPM DO FOR YOU?

What if your organization could improve availability, performance efficiency and quality of just one machine?

Current State	Future State (w/ TPM)
Availability = 85%	Availability = 90%
Performance Efficiency = 86%	Performance Efficiency = 91%
Quality Rate = 94%	Quality Rate = 99%
OEE formula - $85\% \times 86\% \times 94\% = 69\%$	OEE formula - $90\% \times 91\% \times 99\% = 81\%$
At 69%, you produced 1,380 good parts (per week) with a profit of \$2 per piece = EBIT for 50 weeks of \$138,000	At 81%, you can produce 1,703 good parts per week so your EBIT = \$170,000 utilizing the same labor and piece equipment

**ANSWER:** Increased run time of good parts = Increased EBIT of \$32,200 from one machine.

## QUESTION: WHERE'S YOUR HIDDEN WEEK HIDING?

What if you could increase uptime by a mere ten minutes a day?

Minutes per day x days per week = minutes per week	$\frac{10}{5}$ 50	Assuming 50 weeks per year x 40 hours = 2,000. Finding your hidden week provides an opportunity improvement of 2.1%.
50 minutes per week x 50 weeks per year = minutes per year	$\frac{50}{50}$ 2500	
2500 minutes per year Divided by minutes per hour = hours gained per year	$\frac{2500}{60}$ 42	

**ANSWER:** 10 minutes per day or 42 hours gained per year.

# MMTC TPM TRAINING AND IMPLEMENTATION

## 4 HOUR TPM OVERVIEW

*Open enrollment and on-site instruction.*

TPM is a company-wide team-based effort to improve equipment performance, which then leads to higher productivity and better quality. The basic tools of TPM and a plan for implementing them are covered. Students also learn how to calculate and use Overall Equipment Effectiveness, the key metric for measuring equipment performance. This course emphasizes the importance of teamwork and integration between production personnel and the maintenance department.

## 12 HOUR TPM WORKSHOP WITH APPLICATION

*Appointment based on-site over 1.5 days.*

On-site 1.5 days of training. Course is designed to teach operations the philosophy, and skills necessary to transform productive maintenance activities from a cost burden to a cost savings part of the business. Training includes hands-on application in a defined area or specified machine on the production floor. A successful participant should be able to do the following at the end of this course:

- Understand the basic principles of TPM
- Understand the fundamentals of Autonomous Maintenance
- Understand the role of the maintenance department
- Calculate Overall Equipment Effectiveness
- Realize the benefits of implementing TPM
- Understand how world class maintenance teams function
- Understand the significant role that maintenance provide supporting manufacturing and continuous improvement
- Be able to grasp a clear understanding of improvements that could be made at a shop level to dramatically improve the overall performance of the company
- Greater levels of skill for troubleshooting processes and knowledge on how to overcome barriers that exist in manufacturing settings
- Develop tools and facilitation skills necessary to support and improve the maintenance department to world class standards

## 40 HOURS TPM KAIZEN

*Appointment based on-site over 5 days, plus pre-event preparation and post-event follow-up.*

This program is designed for all levels of maintenance and supervision within an organization that is in the manufacturing supply chain. This application could be helpful to all organizations; however, Beyond TPM Maintenance will have a strong manufacturing focus. A Kaizen team will establish a TPM program in a specified process area with a focus on:

- Introduction to TPM (What is it and who does it affect?)
- 8 Pillars of TPM
- Understanding the 6 major losses in manufacturing
- Introduction to O.E.E. (Overall Equipment Effectiveness)
- Autonomous Maintenance (Operator Based Maintenance)
- Introduction to early equipment management
- What is Reliability? What is Maintainability?
- What is Mean Time Between Failure and what is Mean Time To Repair?
- Introduction to Machine Failure Mode Effects Analysis
- Establishing contingency plans for catastrophic failure
- Exercise designed to enhance troubleshooting proficiency
- Managements role in supporting the PM effort
- Establishing cost controls
- Techniques to better control critical spare parts inventory
- How to structure the maintenance scheduling process
- Review maintenance and plant measurables against world class standards
- Transform culture to optimize maintenance performance
- Using maintenance analysis tools to impact performance
- Breakdown Maintenance Management (What is it and who does it affect?)
- Three major activities that impact basic equipment conditions
- Advantages to upgrading the PM program to a Predictive Maintenance Philosophy
- Presentation with A3 Report

**For additional information, contact MMTC West at 616-771-0561 or email at [mmtcwest@rightplace.org](mailto:mmtcwest@rightplace.org).**