

Total Productive Maintenance *in America*



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Foreword

WHAT IS TPM ANYWAY?

Travelling to different companies and meeting with people from many different types of plants, I continue to hear the question: “Why TPM? What is it about TPM that’s so much better than all of the other stuff we’ve got going on anyway?” Mostly, those who ask this question are not that familiar with what “TPM” really is and what it can accomplish. What *is* TPM anyway?

First, TPM—total productive maintenance or total productive manufacturing, as more and more American companies prefer to call it—is a way of working together to improve equipment effectiveness in modern manufacturing plants and commercial facilities. TPM means that *everybody* who works on or around the equipment, not just the maintenance department, is looking for ways to keep the equipment running when it should, as fast as it should, with the highest levels of quality and yield possible. TPM is about people working together to make sure the equipment is operated and maintained the way it should be and to make sure that newly designed equipment is easier to install, start up, operate, and maintain than that which it replaces.

Second, TPM requires a certain discipline about the fundamental ways people care for their equipment. Yes, *their* equipment. In a TPM work culture there is a sense of ownership that I typically do not see in most plants in the United States: people treating their equipment as if it were their own car or truck. This means paying attention to the funny noises it makes, or the vibrations, or the leaks, or the smoke coming from the motors. It means keeping it clean so they can see problems before they become failures. The required discipline of TPM refers to the way *everybody* who operates, maintains, monitors, and supports the equipment cares for it. This includes performing appropriate maintenance inspections, adjustments, and lubrication, and keeping detailed records about the equipment performance and care. Discipline also refers to the training programs, materials, and methods used to ensure that everyone is qualified to perform every aspect of their job roles safely and effectively.

Third, TPM requires that operators become trained to perform some tasks that are traditionally thought of as *maintenance* work. But then, is it really maintenance work? Being trained by skilled maintenance people in your plant to do routine preventive maintenance (PM) inspections, adjustments, and minor lubrication is not really that difficult. In fact, most

operators I know perform similar tasks on their own cars and trucks and around the home or farm. It saves them money and keeps their equipment running. Like most of us, they also know when the task exceeds their skill level and knowledge and that it is then time to call in a professional maintenance technician.

And, finally, TPM is not a single thing, program, or tool. TPM is all of what I have just discussed: *working together to improve equipment effectiveness more than each individual activity or program could possibly achieve by itself*. It's called *synergy* and *interdependence*. That's TPM. Of course, working together in this way may challenge the way people have historically thought about work and their jobs. I would estimate that clearly 80 percent of the success of TPM will be based on how the "people" issues are addressed in your company. TPM is not as much technology and tools as it is mindsets, paradigms, habits, knowledge, skills, and beliefs. The "soft stuff."

This book and the accompanying video series contain many insights into how companies, individuals, and work groups are making TPM work for them. In our western culture, there are no real "TPM cookbooks" that outline each and every step to transform your company and the habits of those who operate, maintain, and design equipment. What works for one company will not necessarily succeed in another. That is the nature of our diverse, and often unique, work cultures and work systems. But, we *can* learn from each other. We can learn how others think about and establish their TPM work cultures in ways that give our companies new foundations from which to build more effective manufacturing and support equipment.

The starting points for TPM *will* vary from company to company, plant to plant, and quite often from department to department depending on the needs of the equipment and of the people. Each of the companies featured in this book and the video series selected their starting point for TPM based on the unique aspects of their work cultures and business needs. Their stories give us a rich perspective of many of the elements and concepts of TPM. The more all of the elements and concepts of TPM are put to work, the more effective your equipment will be, both short-term and over the long haul. No doubt about it! So, start now—put the resources behind your TPM initiatives and measure the results.

Robert M. Williamson, 1995
Strategic Work SystemsSM

Preface

The importance of low inventory operating policies, such as JIT, and the emphasis on quality assurance programs, such as TQM, are well known and have been widely adopted by manufacturers competing in world markets. The realization that productivity, inventory, safety and health, and quality all depend on *equipment performance* is a more recent phenomenon which has piqued interest in companies worldwide.

Performance of facilities and equipment is critical to a manufacturer's ability to produce low-cost, high-quality products; thus, effective equipment maintenance has become increasingly important in the manufacture of quality products. This recognition of equipment's role in manufacturing has led to the development and growing implementation of a comprehensive concept of equipment repair, service, maintenance, and management called total productive maintenance (TPM).

TPM is a methodology and philosophy of strategic equipment management focused on the goal of building product quality by maximizing equipment effectiveness. It embraces the concepts of continuous improvement and total participation by all employees and by all departments. It targets elimination of waste caused by equipment downtime through autonomous group activities and individual operator involvement in tasks found conventionally in the maintenance department.

Total Productive Maintenance in America is an instructional package of five videocassettes and this reference book produced by the Society of Manufacturing Engineers. It tells the TPM story through the experiences of five major U.S. companies that have pioneered TPM in the U.S.: Harley-Davidson, Magnavox, Briggs & Stratton, AT&T, and The Timken Company.

Content of the book parallels that of the video series and was written to serve as a guide for manufacturers as they prepare their competitive strategy for the twenty-first century. The first three chapters describe the hurdles to overcome in getting buy-in from management and shop-floor workers and the types of changes needed to successfully implement TPM.

Chapters 4 and 5 focus on the teams needed to make TPM work and the training of team members for autonomous maintenance. Central to these

are the concepts of empowerment and operator ownership, especially as they apply to keeping *overall equipment effectiveness* high.

In chapter 6, Kevin McGlynn of Briggs & Stratton recounts some of the unique considerations attending the introduction of TPM in a union shop and how the collaboration of his company and its organized labor force led to the successful implementation of TPM.

The importance to TPM of preventive and predictive maintenance is brought to the grass-roots level in chapter 7 as recommendations for developing objectives and a maintenance plan within the framework of a company's particular personality.

Noted TPM expert Terry Wireman describes CMMS, the automated dimension of TPM, in chapter 8. CMMS — the computerized maintenance management system — organizes all equipment information into a workable database that coordinates maintenance activities throughout an entire company and helps identify areas for improvement.

Chapter 9 describes the concept of autonomous maintenance, in which equipment maintenance tasks are done by a team comprised of those workers involved with the equipment on a daily basis—operators and maintenance tradespeople.

The last chapter of the book brings all the material together in a succinct and practical snapshot of what TPM is, what it does, and what it entails, written by TPM expert Robert Williamson.

Acknowledgments

The *Total Productive Maintenance in America* book and video series was, by design, an effort to gather, compile, and disseminate in the most comprehensible form current, accurate, and real-world information on TPM and how it is practiced by leading U.S. manufacturers. This endeavor would not have been possible without the extraordinary contributions of several people closely associated with TPM in America.

SME is indebted to the following people for their selfless participation in the preparation of material for the videos and this reference guide.

Our thanks to Terry Wireman, educator, adviser, and widely read author on TPM, for his intellectual energy in writing major portions of the book and reviewing the entire manuscript.

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