

WHAT DO I TALK ABOUT, WHEN I TALK ABOUT... TPM

TPM has received great attention in a great number of various sources. Just type TPM into a search engine and you will get more than 38 million hits on this subject in less than half a second! Wow! This is a truly remarkable result and a great deal of websites to browse. Some kind of a guidebook on the entire TPM system would be much desired, hence the title which I borrowed from Haruki Murakami, a Japanese writer who wrote a book about running (the subject I shall touch upon in the last article of this series by referring to the TPM system) entitled "What do I talk about when I talk about running". I would like to provide a greater insight into TPM-related subjects through a series of articles, which will – hopefully – become a specific guidebook on this excellent system.

Let me begin with a few words by way of introduction. I have been involved with the TPM system for over 20 years! This is quite a bit of time. During this period, I have dealt with TPM implementations in miscellaneous industries, either as a person responsible for the deployment of the particular TPM pillars in an enterprise or as a person providing advice and training on this system to others. While describing TPM, I shall attempt to present a unique approach to the subject, as demonstrated by the system's originators. Moreover, I shall be sharing my experiences concerning the issues in questions. The series entitled "What do I talk about when I talk about... TPM" will consist of a dozen or so articles which are going to feature all the "arcana" of the TPM system. I hope that each article will provide answers to all your nagging questions. If no answers are found, I would like to encourage you to contact me directly or via the "Szef UR" editor's office.

Let us begin, then...

Although TPM is known all over the world, there are different approaches to the understanding of what TPM really is. The acronym stands for multiple meanings in the English language, such as:

- Total Profit Manufacturing,
- Total Perfect Manufacturing,
- Total Perfect Management,
- Total Preventive Maintenance,
- Total Painted Machine, etc.

It is also possible to find a few TPM acronyms in the Polish language. However, they cannot be directly translated into English without using the first letter and, more importantly, the meaning. Below, there are a few examples of the TPM acronym in Polish accompanied by their phonetic transcription in IPA (International Phonetic Alphabet):

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- Towarzystwo Przyjaciół Maszyn,
[to'va 'zistə 'pʃɨ'jãcjuw 'majɨn]
- Technikum Przetwórstwa Mięsnego,
[teç'niku'm pʃɛ 'tʃurstɨ'a mʲjɛš'wego]
- Trzeba Pomóc Mechanikowi,
[tʃɛ'ba 'pɔmuć mɛxãni kowi]
- Twoja Pracująca Maszyna,
[tʃɔja 'praçuju'jãɕa ma'ʃɨna]
- Totalnie Pomalowana Maszyna,
[to'talɲe 'pɔmalə'wana ma'ʃɨna]
- Tu Płacę Mało.
[tu 'pwašɔw 'maɔ]

As may be seen, the meanings are manifold. As a matter of fact, each one is correct, isn't it? However, the TPM acronym should be understood as **Total Productive Maintenance**, though this term has anyway been created for better promotion of the entire system. Why? The reason is plain, or at least I understand it this way. In the original version, it was difficult to coin a catchy acronym. The system was originally referred to as Productive Maintenance with Total Employee Participation, so the acronym

would be as follows – PMwTER. It would, however, sound a bit strange and artificial. Three-letter acronyms are much easier and more natural to use, hence the formation of TPM. And that would be it when it comes to the English meaning. The situation gets funny when we try to translate this term into Polish. Then, we are faced with different forms of the so-called street “poetics”. To demonstrate this, I would like to quote two examples that I found in the depths of the Internet: całkowite produktywne utrzymanie ruchu maszyn (which, after back translation into English, would read as follows: ‘overall productive maintenance of machinery’) and globalne utrzymanie ruchu (after back translation into English, this would mean: ‘global maintenance department’). Such translations make my hair stand on end (though it might be difficult in my case). Let me begin by saying that the term does not

imply any machines, not to mention “maintenance” as a department or an organisational unit of an enterprise. Unfortunately, however, it generates such associations. If the above-mentioned translations are incorrect, how should this acronym be translated then? The answer is: as simply as possible, by translating the individual words directly: Utrzymanie Całkowitej Efektywności (Total Productive Maintenance). Wishing to gain a broader perspective, one may ask: “maintenance of what or whom?”. In this case, it is about maintaining the total productiveness of an enterprise. Going even further and referring to the original name, the originators focused on constant involvement of all employees in maintaining the productiveness of the particular processes in an enterprise. In this case, it does not matter whether the enterprise is highly automated or consists of simple assembly processes.

In both cases, the key is to eliminate the individual losses suffered during manufacturing processes, thereby increasing their effectiveness.

Where does this whole TPM thing come from? The history of TPM dates back to 1940s and is based on the Productive Maintenance (PM) programme, which was originally developed in late 1940s and early 1950s in American manufacturing enterprises. The manufacturing process management system present in those enterprises was based on scheduled preventive maintenance, where the technologies used were supposed to increase reliability and extend the uptime of manufacturing equipment so that their manufacturing programmes could be fulfilled. In 1953, twenty Japanese companies formed a PM research group and, in 1962, it was sent on a research mission to the

Stage	1950s	1960s	1970s
Emerging Concepts	Preventive Maintenance – establishing basic maintenance functions	Productive Maintenance (PM) – recognising the importance of reliability, technical support and ergonomic efficiency in plant design	Total Productive Maintenance (TPM) – Achieving PM efficiency through a comprehensive system based on respect for individuals and total employee participation
Supporting Theories	Preventive Maintenance (PM) 1951 Productive Maintenance (PM) 1954 Maintainability Improvement (MI) 1957	Maintenance Prevention (MP) 1960 Reliability Engineering 1962 Maintainability Engineering 1962 Engineering Economics	Behavioural Science Innovation and Creation (MIC) Performance Analysis and Control (PAC) Systems Engineering
Significant historical events	1951 – Toa Nenryo Kogyo the first Japanese company to adopt the PM 1st philosophy 1953 – 20 Japanese companies form a PM research group, which later became JIPM 1958 – American George Smith visits Japan to promote the PM philosophy	1960 – Japan hosts the international maintenance convention 1962 – Japan Productivity Association sends its representatives to the USA to study equipment engineering 1963 – Japan attends the International Convention on Equipment Maintenance in London 1964 – the first PM prize awarded to the Nippondenso company from Japan 1969 – Japan Institute of Plant Maintenance (JIPM) was established	1970 – the annual International Maintenance Convention on was held in Japan

Table No. 1.

United States to observe the Productive Maintenance (PM) programmes in place across American enterprises. This group subsequently became the Japanese Institute of Plant Engineers (JIPE) and, in 1969, changed its name to JIPM – Japan Institute of Plant Maintenance, which is the originator of the entire TPM system. The first use of the TPM acronym was in the Japanese automotive component manufacturer – Nippondenso – in 1961. This company would later become the very first company in history to win the JIPM PM prize for TPM implementation. Early TPM implementations in Japan took place within the automotive industry, particularly within Toyota plants and their cooperating entities. The next companies to follow Toyota in implementing TPM were such automotive giants as Nissan and Mazda. The period of 1970s experienced a boom in TPM implementations in the form proposed by the father of the system – Seichii Nakajima. It was Nakajima who created the standard TPM implementation process, building on the structured phases of the system, which became a repetitive methodology for the implementation of the global approach to TPM. The implementation of the TPM system helped Japanese companies to successfully withstand the difficult period of economic challenges in early 1970s. Following its success, TPM finally reached the western world in 1980s and 1990s, and has been implemented – with varying effects – in numerous enterprises ever since. Table No. 1 above presents the development of the TPM programme – based on Nakajima, S. (1984). Introduction to TPM: Total Productive Maintenance.

As demonstrated by the history of TPM, it continues to have ardent supporters who systematically and painstakingly implement the individual TPM pillars in their parent companies. It is sufficient to show that, if companies are determined to adopt this approach, they achieve really excellent results in the following categories:

P – Productivity

- A 1.5- to 2-fold increase in productivity
- Reduction of unplanned downtime from 1,000 to 20 within a month

Q – Quality

- Reduction of quality errors from 1% to 0.1%
- Reduction of customer complaints by 75%

C – Costs

- Cost reduction by 30%

D – Deliveries

- Reduction of WIP and finished goods inventory by 50%

S – Safety

- Elimination of accidents
- Elimination of accidental events

M – Employees' morale

- Increase in improvement recommendations (the suggestion system) from 5 to 10 per employee

The TPM implementation process according to Seichii Nakajima's model is carried out in 12 steps, which are structured into the particular implementation phases, as shown in Table No. 2 below. Subsequent articles will feature methodological descriptions of the individual TPM implementation steps in a manufacturing enterprise. As has already been noted before, my subsequent articles will also explore the unique approach of the system's originator as well as my own approach, taking into account both our economic and mentality-related conditions – where the latter deserve particular attention. So, we are embarking on a certain adventure and route depicted in 12 consecutive steps. Each step will cover something new, unprecedented and – hopefully – inspiring. I would like to invite you to familiarise yourselves with my approach to the issue of TPM. I truly hope that, after becoming familiar with the whole series, you will find out what do I talk about when I talk about... TPM.

Phase	Step
Preparation	Step 1: Announcing the Management Board's decision on TPM implementation
	Step 2: Launching an educational campaign as an introduction to TPM
	Step 3: Organising the promotional structure from TPM in an enterprise
	Step 4: Establishing the basic TPM policy
	Step 5: Creating the master plan for TPM implementation
Initial implementation	Step 6: Official TPM kick-off
Implementing TPM pillars	Step 7: Enhancing the productiveness of machinery and processes
	Step 8: Developing the Autonomous Maintenance programme
	Step 9: Developing Planned Maintenance
	Step 10: Performing courses and training sessions
	Step 11: Developing the Early Machine Management programme
Stabilisation	Step 12: Bringing the TPM programme to a higher level

Table No. 2.