

**TPM PROCESS PRINCIPLES ANALYSIS OF THE IMPORTANCE OF DEVELOPED
COUNTRIES**

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Abstract: The introduction of the TPM system into the processes means continuous improvement in the maintenance of production. Technical work is transferred to production personnel, who now provide the operator with a better understanding of the equipment and devices he is working with, its features and capabilities, its importance when involved in maintenance tasks, helps to work as a team. It facilitates the exchange of experience and mutual learning, and with all this, employee motivation increases, performance results improve.

Key words : equipment , system , economical , employee , speed, Machine, system.

The Japan Automobile Maintenance Institute has developed a 7-step method, the purpose of which is to achieve a change in attitude that is essential for the success of the program. I will introduce the stages of development after the implementation of the TPM system. (Table 1.3.1) Management informs the company about the decision to implement the TPM system. The success of the program depends on the attention given by management to its announcement to all employees. Psychologically prepare all employees to cooperate in order to meet the expectations and goals of the TPM program. The company's top management should officially announce the decision to implement the TPM program in the organization. It will be necessary to organize company TPM seminars and events. Analysis and improvement of the efficiency of each of the company's equipment begins. An information system is established and established to record and analyze data on reliability and stability. The most important, strategic or production-related equipment, or equipment with chronic losses in the last 3 months, is selected as the test equipment and corrections are made. After the targeted improvements are implemented, the results are verified.

Table 1.3.1

Development stages after implementing the TPM system

1	Initial cleaning	A dust removal and lubrication program is carried out, and its components and equipment are adjusted.
2	Machine cleaning	Avoiding the causes of dust and messy work, improving access to hard-to-clean and lubricate areas, two main functions are to reduce the time required for cleaning and lubrication.
3	Preparation of lubrication processes	Standard procedures are prepared, cleaned, lubricated component adjustment work is carried out in a short time.

4	General inspections	Production staff responsible for minor adjustments are trained to resolve
5	Autonomous inspections	Checklists for machines are prepared and put into practice by the operators themselves
6	Distribution procedure	It is about creating procedures and standards that reflect parts management and more.
7	Optimization in activity	The final stage is continuous improvement across the company, with time between failures systematically recorded.

Initially, the 7 main losses affecting the overall efficiency of the equipment are analyzed, prepared, tool replacement, commissioning, minor stops and idle operation, speed reduction and elimination of defects in the work. Currently, the maintenance department significantly increases its work due to the requirements created by the groups from the production areas. The implementation of autonomous maintenance activities by production personnel is self-maintenance, ensuring that each operator is responsible for the effective care of the equipment entrusted to them. Maintenance personnel must be fully competent in their work. Compliance with standard requirements is required to put safety first.

The TPM system is now widely used in many developed countries, including the United States, Germany, South Korea, and other countries, in addition to Japan. This system is recognized by global companies as a means of increasing production efficiency, controlling quality, and reducing costs.

In the US, when implementing the TPM system, large US companies such as General Electric and Ford introduced TPM in the 1980s. Here, TPM was integrated with ISO 9001-2015 quality management systems. Companies effectively helped identify waste in production through TPM. Strengthening the sense of ownership of employees in their workplaces increased efficiency and achieved goals. Example; After implementing TPM at Ford, equipment downtime was reduced and product defects were reduced by 45%.

In Germany, as a technology giant, TPM is used in highly automated equipment. BMW, Bosch and other companies have paid great attention to improving production efficiency through TPM. They have especially strongly established the principles of preventive maintenance and quality control. It allows for automated monitoring of equipment condition, warnings and service life planning.

In Japan, the TPM system has become an integral part of production. Toyota, Nissan and other giant companies are working on the basis of TPM. The TPM system has been adopted as a key tool for optimizing production processes. In Japan, TPM is used in conjunction with Kaizen continuous improvement methods for organizing the workplace. I will cite important factors in the development of TPM. It is possible to improve the efficiency of production processes . Their experience is of great importance in the TPM system in optimizing production processes and increasing the reliability of the overall efficiency of equipment. (Scheme 1.3.1)

South Korean companies like Samsung, LG, and Hyundai have deeply embedded TPM principles into their manufacturing culture. Each department is responsible for its own equipment, and if a problem occurs, the entire team must quickly fix it .

In the Italian industry, Ferrari has implemented the TPM system in its production processes. This system has helped to increase production efficiency and quality by 18%, while maintaining high technical requirements in the automotive industry (Table 1.3.2).

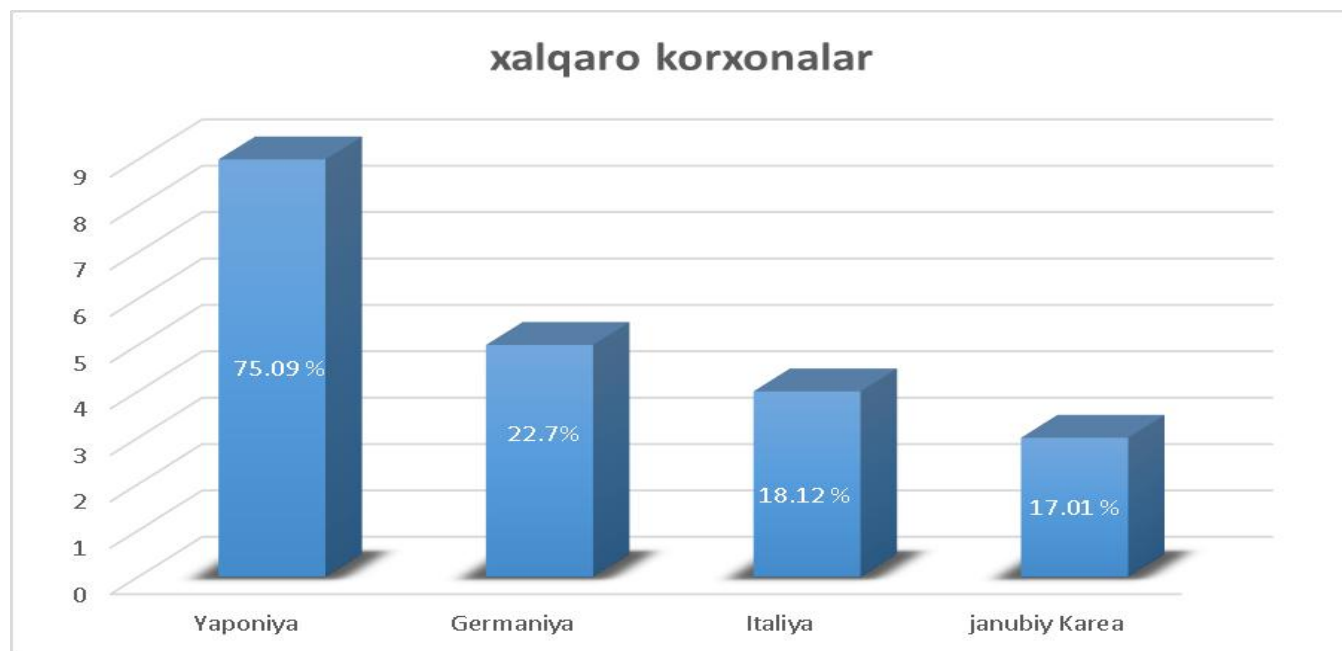
Table 1.3.2

Indicators of companies that have implemented TPM

Countries	Companies	Efficiency%
Japan	Toyota, Nissan	75.09 %
Germany	BMW, Bosch	22.7%
Italy	Ferrari	18.12 %
USA	General Electric, Ford	35.4%
South Korea	LG, Hyundai	17.01 %

1.3. 1 - diagram

Indicators of international companies that have implemented TPM



In conclusion, the correct selection of testing methods to improve product quality. We have studied the data on the TPM system in the automotive industry and its development in international enterprises. We can see that Japan's Toyota Motor Company is the most efficient enterprise in the history of the TPM system, having implemented it to 75.09%.

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