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Total productive maintenance (TPM) – Implementing key performance indicators – Guide



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Foreword

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As a guide, this PAS takes the form of guidance and recommendations. It should not be quoted as if it were a specification or a code of practice.

Presentational conventions

The guidance in this PAS is presented in roman (i.e. upright) type. Any recommendations are expressed in sentences in which the principal auxiliary verb is "should."

Comments, explanations, and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. "organization" rather than "organisation").

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Introduction

Total productive maintenance (TPM) is a management system for equipment management and productivity maintenance primarily in the discrete parts manufacturing industries and process industries, centred on automation lines, with the aim of reducing losses to zero.

Japan introduced preventive/productive maintenance (PM) from the United States in the 1950s through the 1960s. In 1971, Nippondenso Co., Ltd. (now DENSO Corporation), a general manufacturer of automotive parts, and JIPM created TPM based on the PM concept.

TPM involves all the employees in the efforts to improve, according to the capabilities of each employee. After that, TPM is improved by developing the culture of persons and equipment in order to improve the corporate constitution and build a profitable corporate organization.

TPM has been adopted and popularized in various manufacturing industries worldwide. The purpose of this PAS is to clarify the concept of TPM, help organizations to implement TPM and provide a common understanding of it.

Typical indicators at a manufacturing site are Q (Quality), D (Delivery), C (Cost), S (safety), etc. which are delivered by the following management systems:

- total quality control (TQC) – Q;
- lean manufacturing method/just-in-time (JIT) – D; and
- TPM – C.

Whereas TQC targets quality (focusing on output and results), TPM is characterized by targeting equipment (focusing on input and equipment function). The principle of the lean manufacturing method and JIT is to eliminate waste (“Muda”), while TPM is to prevent loss; they are closely related even though they appear to be different. In practice, preventive maintenance activities ensure stable operation of equipment, leading to zero loss due to product defects and equipment stoppage. It is important to manage and optimize safety inventory for delivery responsibilities and inventory for preventive maintenance time, and these methods are intended to be used in a balanced manner to achieve a high level of success, leading to the creation of a stronger corporate structure.

This PAS is intended to enable organizations that are introducing TPM to better understand it. It is also important to continue TPM after it is introduced, and this PAS is of use to organizations that have already introduced TPM.

1 Scope

This PAS gives guidance on the concept of TPM and the key performance indicators (KPIs) that are relevant to implementing it. Guidance is provided on TPM for manufacturing plants and equipment.

The PAS is relevant to any organization in the discrete parts manufacturing industries and process industries. It is intended for persons involved in the operation and/or maintenance of plants and equipment, or persons working in the manufacturing department, the quality department, the maintenance department, the production department, the supply chain, etc.

NOTE 1 *This PAS sets out the basics of TPM as described in IATF 16949 for companies seeking IATF (International Automotive Task Force) certification, and does not preclude the expansion of the scope of application or the introduction of new technologies based on these basics.*

This PAS does not cover specific issues with the lean manufacturing method and JIT or TQC.

NOTE 2 *This PAS has adopted gender-neutral language; specifically, using the term “worker” instead of “man”.*