

# Maintenance management and the production company management

František Helebrant<sup>1</sup>, Josef Jurman and Jiří Fries

## Firemný manažment údržby a výroby

A systematic and professional attitude to the maintenance management, as professional technical activities, has to be followed by firms and production companies for their organization processes including the maintenance. Then, an excellent level can be achieved according to the theory of vitality. In practice, it means that the maintenance is controlled in right way and the principles of the vitality theory have to be applied into the maintenance management. Application principles of the vitality theory in the management for maintenance management as a professional technical activity.

**Key words:** Maintenance management, operational reliability, human sources and capacity, productive capacity and production quality

## Introduction

To operate any productive company, we have to recognize its inner activity and background. It means to know and force the logics upon the actions which we understand. In practice, we have to guarantee four basic and vital signs, which will support fine functions of the productive company.

The present modern business uses solving devices including previously ignored problems. It is mainly the maintenance in condition of its systematic and procedural comprehension. The easiest and basic view of the production equipment maintenance is the aim of the maintenance. Then, its operative state when we work with optimal costs. It is very difficult to solve the aim, because the maintenance belongs to the basic processes of production but, on the other hand, it is a very contradictory process. Firstly, it uses the financial devices, labourers, the reduces time fund and so on. On the other side, it eliminates the ordinary wear and tear, that is, it renews the service life.

Now, we will discuss the process management which is so difficult that it is very close to the management of the productive company. This process is characterized by a certain ration of vagueness during its operation. This fact is raised by the human element or the human sources management, because it is generally known that no one can precisely predict the behaviour of all systems where the human element is included.

Consequently, the maintenance becomes an inseparable and an integral part of every production process in productive companies, when it is understood as *a procedural and a technical activity*. It means that it needs to define a vision and a strategy, formulates measurable and controlled aims, simplifies processes, sources claims and the structure, and raises a people's motivation, uses feedbacks and forward connections etc. Subsequently, it creates presumptions both of a proper maintenance operation and the whole productive company.

## Management of productive company or firm [8], [9]

The theory of vitality nowadays covers the following factors: the recognition of important facts from irrelevant ones, the team leading and the motivation of people, the strategic thinking, the team cooperation, the settlement of conflicts and the change management. Moreover, everything is connected in an integral system. The vitality is a state in which systems achieve a sustainable success. It means that it fulfils the determined present aims without the threat of solving future aims. Consequently, the basis "*Management by Competencies*" (MbC) comes into existence arising from three main sources:

- Theory of vitality (Jiří Plamínek 2000 [8]).
- Theory of restriction (Eliyahn M. Goldratt 1990).
- Qualified rules (Roman Fišer 2004 [9]).

Figure 1 explains this fact and also shows that:

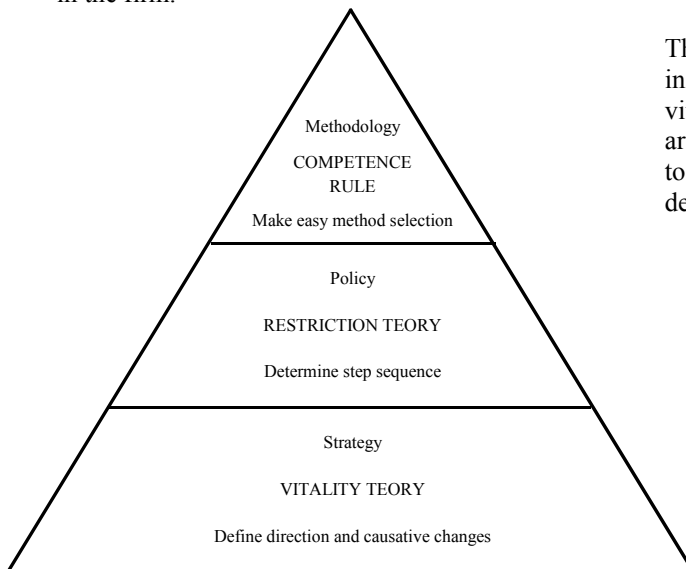
- Theory of vitality – it explains the basic causal relations and connections in systems with a human element, ie. It determines the AIM and the STRATEGY of creation within a vital system.

<sup>1</sup> doc. Ing. Helebrant František, CSc., prof. Ing. Jurman Josef, CSc. and Ing. Fries Jiří, Ph.D., Department of production machines and design, Faculty of mechanical engineering, VSB Technical University Ostrava, Czech republic (Recenzovaná a revidovaná verzia dodaná 5. 10. 2006)

- Theory of restriction - it shows the ways of searching for the proper spot, ie. The spot where one puts the effort and determines the TACTICS of creation within the vital system.
- Qualified rules – predetermines the METHODOLOGY of achieving strategic and tactic aims of the vital system.

The system is built on strategic level in accordance with The pyramid of vitality (Picture 2), then the vital element is defined by theory of restriction. The mentioned element is present and it transfers everything to the field of particular tasks and authorities. To conclude, the theory of vitality is the base MbC and I will try to summarize entity of Picture 2. There will be a reference to [8].

- UTILITY – if there is a meaningful feature in any productive company, it has to offer an utility, ie. It has to offer products for various subjects in order to satisfy their needs, therefore we can determine production processes.
- EFFECIENCY – there has to be an effective organizational structure in the production process and it has to decide about the sources, which we will need in all processes. This fact is sometimes called 3E (economy – efficiency – effectivity).
- STABILITY – first two vital features lead the firm in the balance but it is necessary even in changing conditions, ie. The development of a functional system of feedbacks and monitoring including the acceptance of completed changes by all firm is employees.
- DYNAMICS – it anticipates the development and turbulences, it reacts on them in advance – the prognosis. It consists of the proactive management or forward connections and the people’s activity in the firm.



The pyramid of the mana-gement vitality in the firm is based on the guarantee of four vital features. Then fine func-tion of the firm are guaranteed. Consequently, it is easy to stabilize it, to build new similar and demanded ones for all productive processes.

Fig. 1. Management by Competencies.

**Maintenance management**

We are firmly convinced that there are no generally accepted opinions about the maintenance (“maintenance is a necessary evil ” or “we cannot do anything to reduce the maintenance costs”), being valid some 15 – 20 years ago. The present view on the maintenance is more modern and it becomes the ortoprocess (one of the main processes).

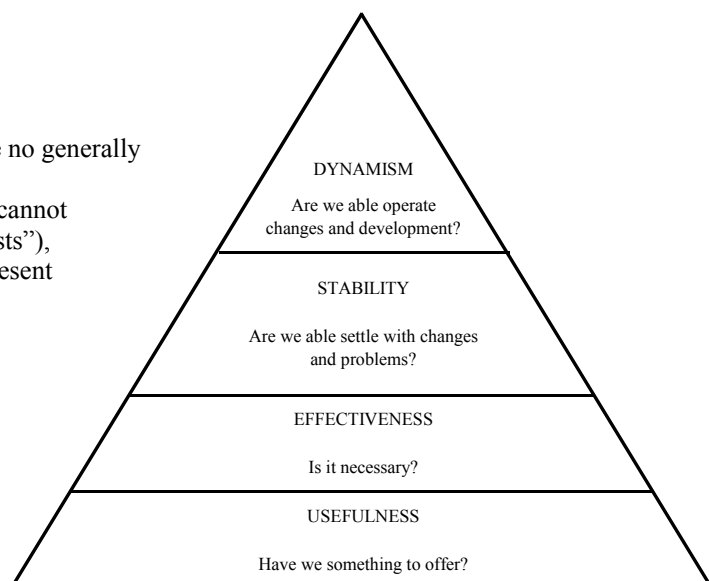


Fig. 2. Pyramid of vitality.

It is a consequence of growing interest in the efficiency, reducing stoppages and energetic costs, raising of the operational reliability and the operating safety. Then, the maintenance is a mean to the production increase, quality enhancement, total firm efficiency, optimization of the available production equipment, operating ability and the operating safety, etc.

In my publication [3] I declared, that the maintenance is a multiprocess from the point of view of the production maintenance. Therefore, we can write the following equation: TPM = MPM (Total Productive Maintenance = Maintenance .... Multiprocess). TPM – we can change M as the maintenance for M as Motivation, Monitoring, Management and Manufacturing (Fig. 3). The PYRAMID OF MAINTENANCE (Fig. 4) can be shown as well, including other opinions on the problems (Fig. 5 and 6).

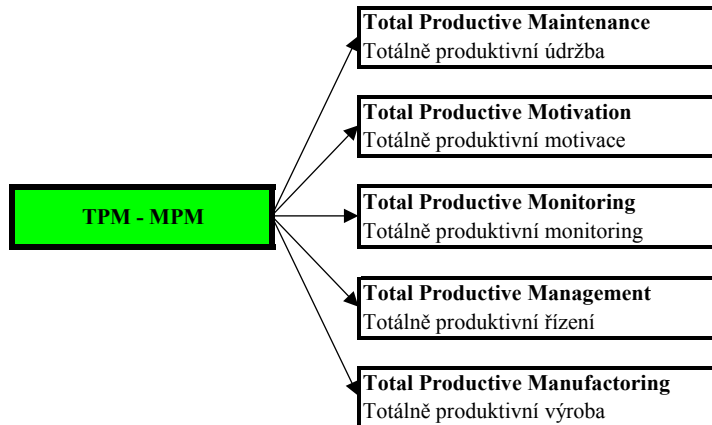


Fig. 3. TPM = MPM.

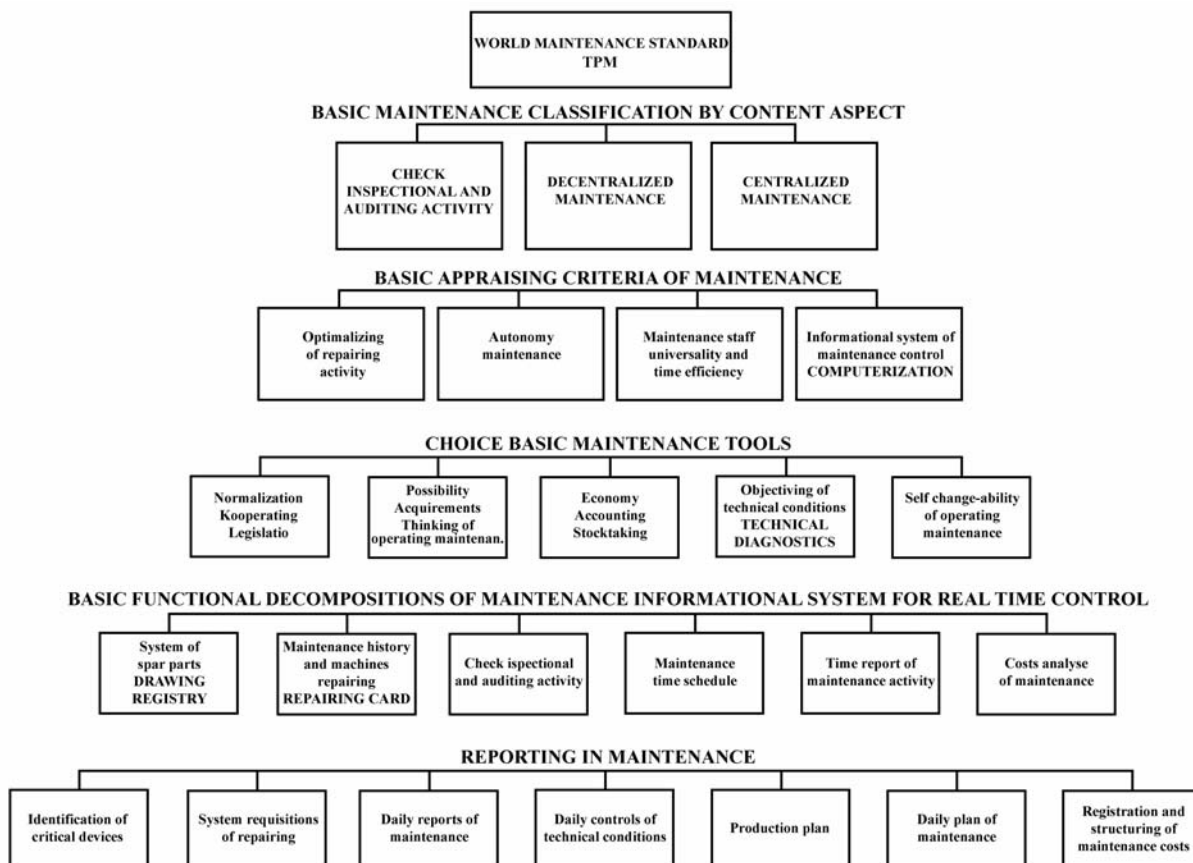


Fig. 4. Pyramid of maintenance.

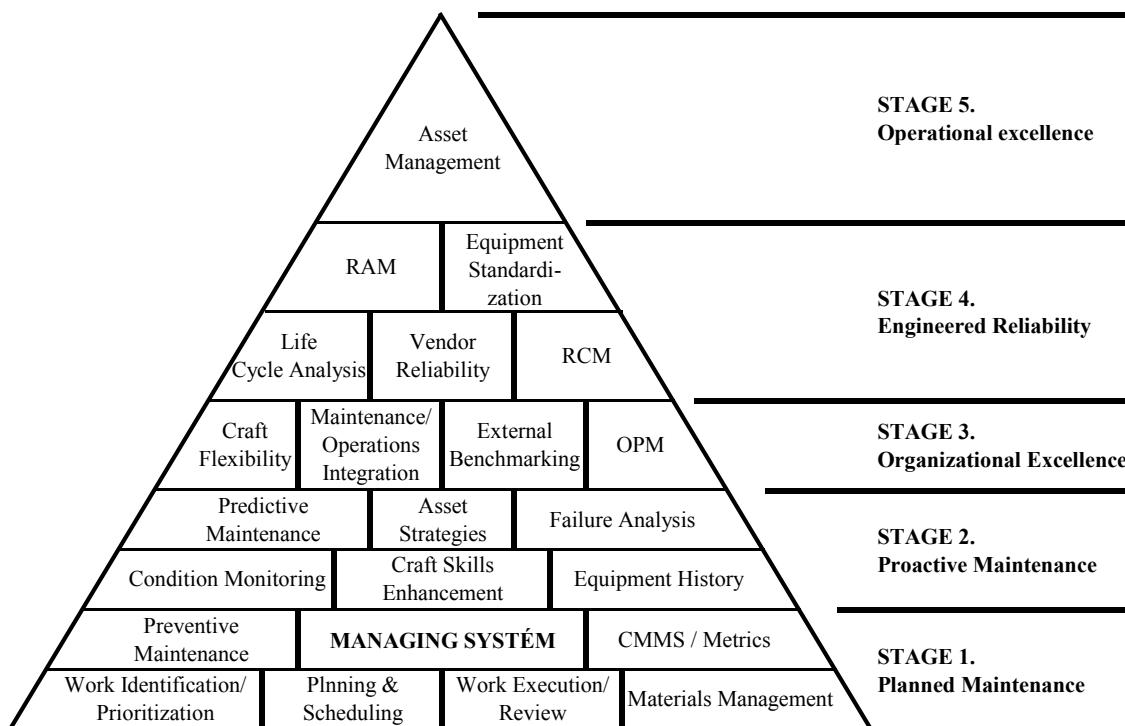


Fig. 5. Triangle SAM by Brad Peterson (Strategic Asset Management).

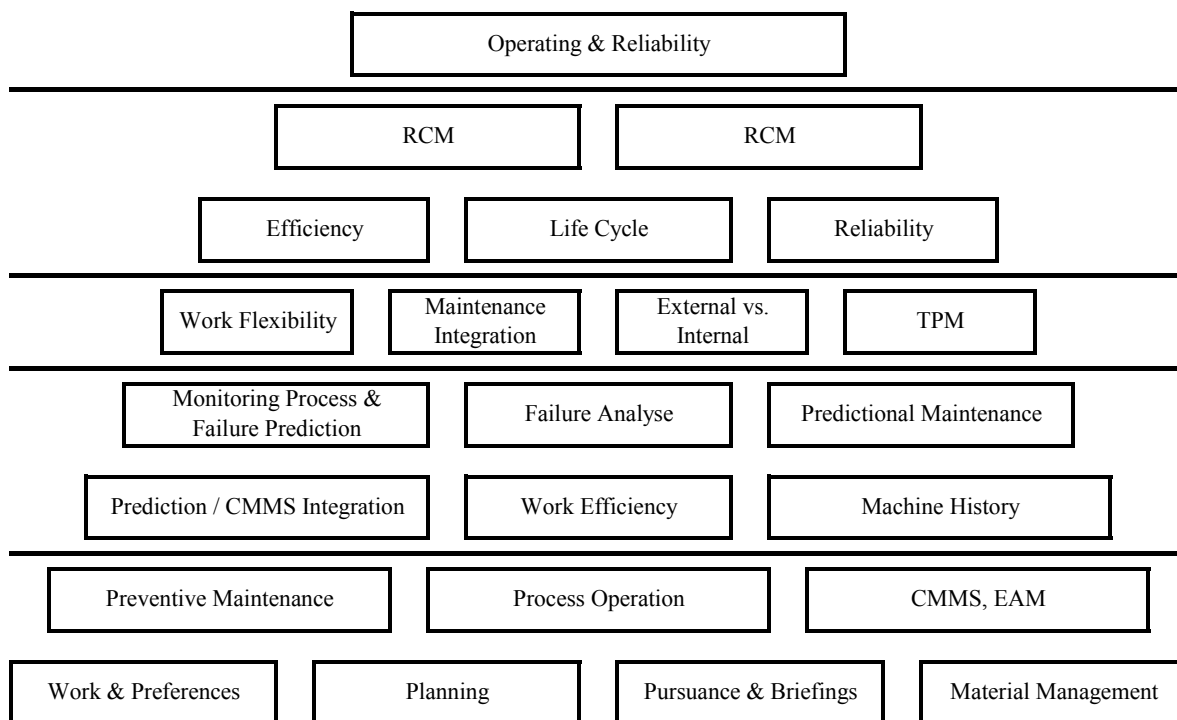


Fig. 6. The position of information technologies in the processes of maintenance efficiency.

To sum up, the maintenance problems from the mentioned publications [2], [3], [11], other non-specified books and from the views presented in [1], [4], [5], etc., are discussed.

### Maintenance management and firm management

In this part I am going to focus on the mentioned theory of vitality (or MbC) and its application in the maintenance management. First, I will concentrate on the above stated four vital features (Fig. 2).

- Utility
  - o Product – solving of the MAINTENANCE MANAGEMENT in a chosen productive company.
  - o Subject – ORGANIZATIONAL UNIT in the productive company (e.g. Inc., divisions, service, working place etc.).
  - o Demands – guarantee of OPERATIONAL RELIABILITY and ACCEPTABLE RISK DEGREE OF OPERATING SAFETY within productive machines and equipment.
- Efficiency
  - o Process – a necessity of maintenance understanding as a PROCEDURAL AND TECHNICAL ACTIVITY, ie. a systematic and procedural approach (management, controlling, methods, processes).
  - o Structure – CONCEPTION and ORGANIZATIONAL STRUCTURE OF MAINTENANCE in the productive company or firm.
  - o Sources – MEANS OF MAINTENANCE GUARANTEE (tribology and tribotechnics, technical diagnostics, information technologies, disassembly and assembly approaches and devices, etc, see [3]).

I am convinced that the application of the 3E rule in the maintenance means actually THE 3P RULE [3]:

- o PREVENTION (application in the right time, in advance).
  - o PROACTIVITY (searching for failure causes and so on).
  - o PRODUCTIVITY (maintenance is an integral part of production and therefore it is the solution of the productivity).
- Stability
    - o Feedbacks and monitoring – actually it is monitoring of operational reliability of each machine, constructional site and so on, of course, EVALUATION OF MAINTENANCE EFFICIENCY (maintenance audit, audit of maintenance management quality, analysis of operational risk).
    - o Acceptation – INTEGRATION OF ALL FIRM WORKERS into the maintenance system, ie. everybody has to participate in the maintenance, not only the maintenance workers.
  - Dynamics
    - o Forward connections – continual solution to maximize the operational reliability, which is based on the efficiency evaluation and progressive trends in the maintenance. It leads to MAINTENANCE REENGINEERING, ie. changes in PHILOSOPHY and STRATEGY OF MAINTENANCE
    - o People's activity – positively, it has to be based on changes in workers' thinking and attitudes, which is possible only in case of EDUCATION and QUALIFICATION (studies and certificates)
    - o Prognosis – determination of residual lifetime within machines and equipments (time to repair) in order to improve the production management. It is based on the firm decisions, ie. DIAGNOSTICS, CONTROLLING AND AUDITOR'S ACTIVITY

Consequently, the accomplishment of vital features means the accomplishment of processes within the maintenance realization – Fig. 7.

Now it is obvious, that the application of theory of restrictions into the maintenance means an evaluation of failures and therefore the critical element of productive process is determined, solutions of problems within machine reparability and productive process equipment, solution of possibilities to maintenance guarantee, solutions of human sources in maintenance. Application of competitive rules means definitely determination of competences to all maintenance and production workers in order to secure maximal operational reliability. A work with human sources and the team cooperation within the maintenance field is another task.

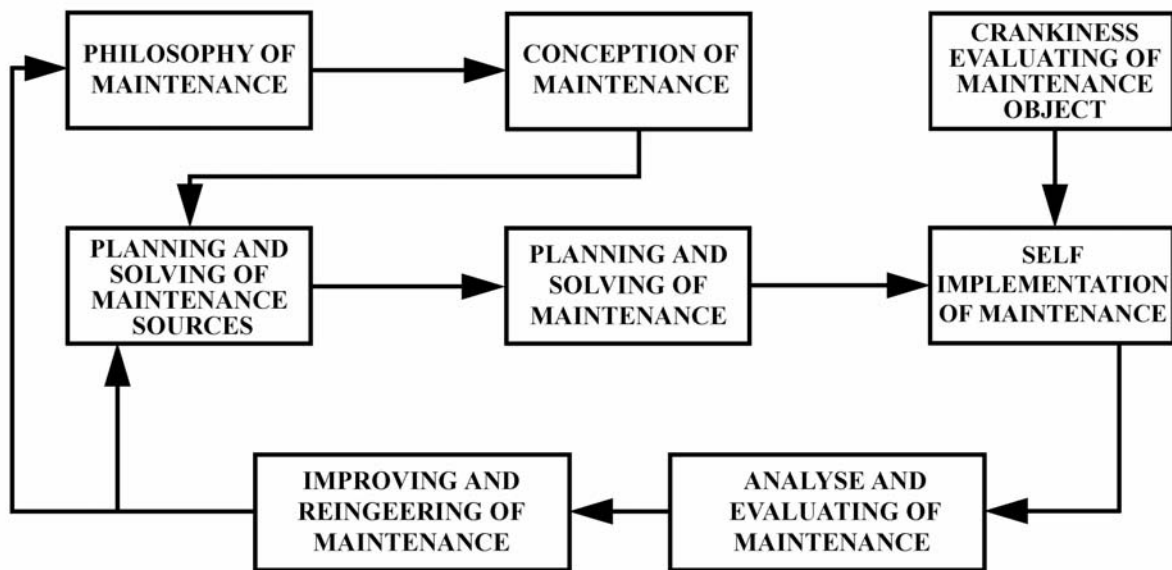


Fig. 7. Basic processes of the maintenance realization.

### Summary

To sum up the article – “An effective using of processes connected with the maintenance is a best way of using the property and personal sources” [3]. Savings created by the procedural and technical activity are in following scopes:

- Elimination of unplanned stoppages caused by failures and breakdowns.
- Higher using of human sources and capacity.
- Enhancement of productive capacity and production quality.
- Reducing of maintenance costs.
- To maximize operational reliability due to the right service of machines and equipment.

### A final word

“Every modern productive company has to be able to accept and implement new methods and principles including solutions of production machines operational reliability, which will lead to the performance and productivity increase, otherwise they are not able to survive at the present market.”

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