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EFFECTIVENESS ACHIEVEMENT OF MAINTENANCE PROCESS BY THE CONTROLLING APPROACH

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ABSTRACT: This paper presents controlling system in the maintenance process in the selected firm. It provides information about process of system Kaizen installment and controlling and about results that firm had achieved after installing of such accesses. These methods are very important instrument for costs decreasing in process of maintenance and by the controlling is possible to improve financial indicators in the firm.

KEYWORDS: Kaizen, cost, controlling, maintenance, permanent improving

INTRODUCTION

High cost for maintenance between 15-40% of production cost press managers to increase awareness of maintenance managing. Cost decreasing, profit achievement, high job security, decreasing of negative impacts to the living environment connected with maximal reliability and durability of production equipments are subjects of new philosophy with mark RCM (Reliability Centered Maintenance), maintenance that is orientated to the reliability and TPM (Total Productive Maintenance) that is one part of TQM (Total quality management). TQM is instrument for solving problems in area of services. [1] From the view of controlling there is very important maintenance character, since according maintenance character algorithm of maintenance indexes following will be stated for example cost, maintenance performance, etc.

Prof. Kassay in his book „World class firm” defines three basic factors for world class firm success. Cost, quality and time belong to such factors. [8] Massaki Imai in his book „Gemba Kaizen” defines improving through QCD access, that means orientation to the quality, cost and supplies in sense of client’s needs satisfying. [4,8]

Whole level of cost in the firm influences financial situation in the sense of two accesses mainly efficiency and profitability. [3] These indexes are reflected in cost saving and in the effectiveness of production factors using in the sense of production volume maximization and efficiency by profit maximization. Both elements are directly intervening to the cost management. Various methods are using for cost decreasing that bring certain contributions in the sense of cost decreasing. Due to these facts we can state that basic assumption for building of world class firm is already cost decreasing in every process in the firm. [5,2,] We will deal with cost decreasing in process maintenance in the selected firm by using new modern trend of management as Controlling.

MAINTENANCE PROCESS AND ITS TENDENCY

Maintenance presents sum of technical, administrative and managing activities, connected with life cycle of technical equipment, orientated to the maintain or renewing of the function of given equipment. [4] With technical equipment maintenance there is linked cost for maintenance, that significantly influence volume of production cost in the firm. [5] Due to the given facts there was necessary to solve problem of high cost of Maintenance Department in selected firm. Maintenance in the firm can be provided by preventive maintenance - before failure detection or corrective maintenance - after failure detection (Figure 1). The preventive maintenance is effective than corrective maintenance. Strategy of reliable maintenance of technical equipment is orientated to the areas that define following questions:

- What are functions and assigned standard characteristic of the equipment in its present service context?
- By which way equipment will stop to fill its function?
- What causes every function failure of the equipment?
- What if there will be equipment failure?
- What is consequence of arising equipment failure?

- How it is possible to prevent equipment failure?
- What should be done, when it is not possible to find proper preventive solution?

According such questions we can decide, what form of maintenance it is possible to use from the view of care for equipment (fig.1). Tendency of maintenance describes orientation of this process in the firm. The third generation of maintenance level is orientated on reliability, security, quality, costs, environment and durability (fig.2).

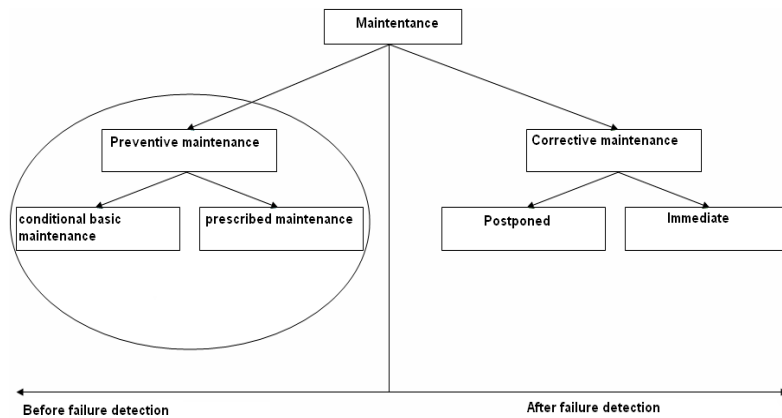


Figure 1. Maintenance according STN EN 13 306

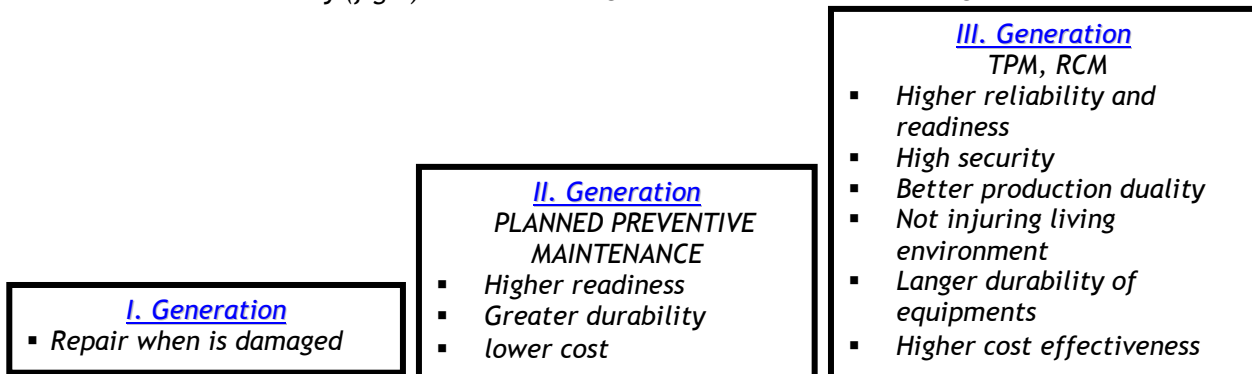


Figure 2. Demands for III - Generation Maintenance [6]

DETERMINATION PROBLEM IN THE MAINTENANCE PROCESS

Goal of the research have been increasing of maintenance effectiveness in the firm through Kaizen application and controlling support and to reduce costs in process maintenance.

METHODS OF PROJECT

Basic task of the firm's management is to state goals, to plan, to realize the plan, to compare plan with reality, to control result, to suggest and realize measurements for stated goals achievement. There is therefore task: How to be more effective? How to come to the problem and what measurements install when plan is significantly different from the reality? Controlling provides answer to such questions - since controlling is tool of the managing decision, which aim is to achieve stated firm's goals through planning methods, budgets, calculation and analysis [2]. Complex process has been orientated to the controlling using during following of individual cost rising and to the finding of discrepancies, that influence cost increasing in maintenance.

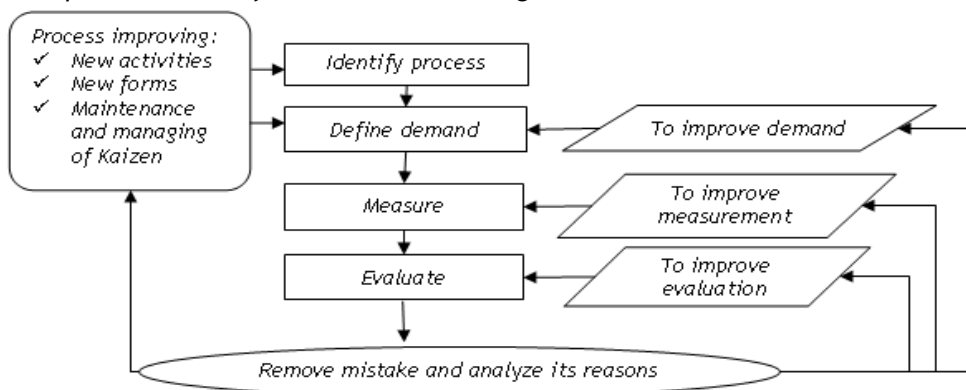


Figure 3. Process of Kaizen method [7]

The problem solving in concrete firm has been orientated to the cost optimizing in maintenance through elaborated information flow in SAP system Module Controlling. Controlling is instrument of such decision, since controlling is information system, linked to the maintenance module, in which information about total maintenance cost are presented, that serve for management during alternative choosing for maintenance performance, that is own capacities or external outsourcing. Controlling is very important instrument for reduction of costs and it is instrument of Kaizen, because it affords continual improvement. By implementation of controlling we used approach Kaizen. Kaizen method is one of the accesses that is used in the practice and that achieved considerate success

mainly in Japan. Best known method of permanent improving is based on the creative thinking of employees and it is naturalized in Japanese firms and it starts to be applied and used also in the world. Whole process access of this methodology results from PDCA cycle (plan, do, control, and act). Every activity that is used during Kaizen method for removing of wastage must be integrated in PDCA cycle. [7]

METHODOLOGY OF MAINTENANCE PROJECT SOLUTION

In first step we have analyzed reasons of inefficiency of such process that have reflected in high cost for maintenance by controlling. We created new system of evidence of process maintenance in the firm following figure 4.

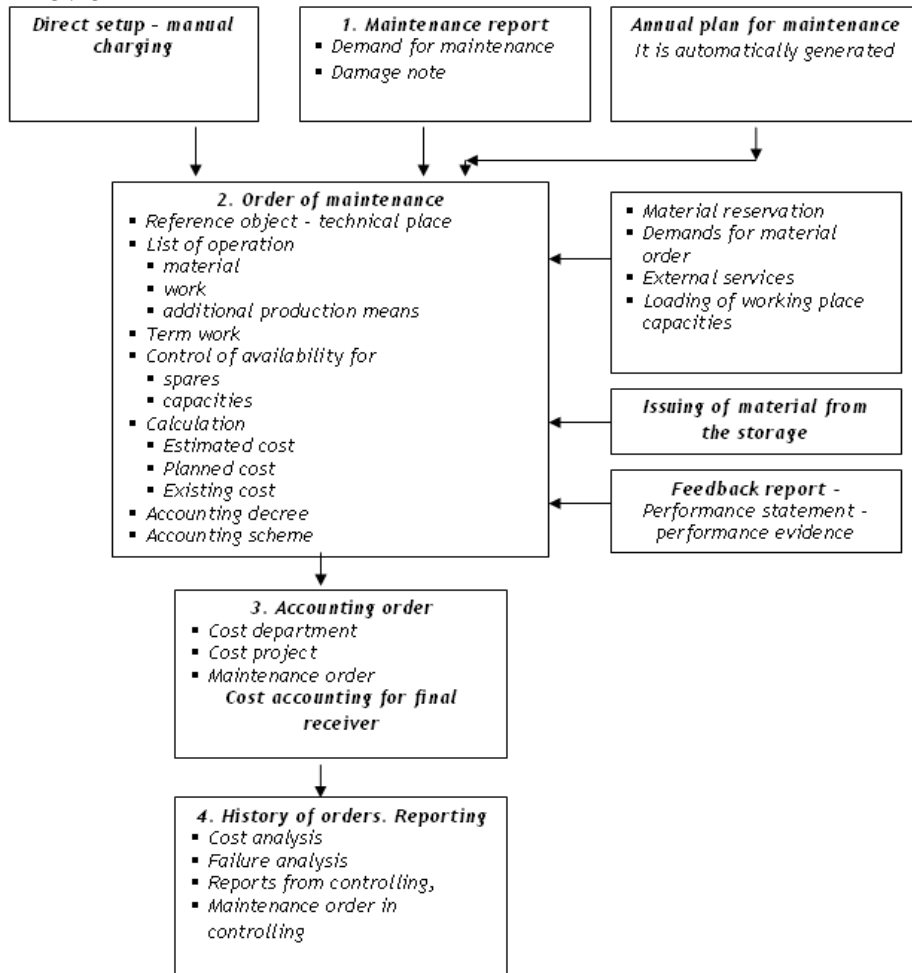


Figure 4. Controlling system for maintenance process in the firm

Whole process of controlling during managing of maintenance goes through gradual algorithm of steps. Presumption of effective controlling function is evidence of objects, equipments, machines and instruments that is long term property that needs to be maintained. Process of maintenance in controlling module of concrete firm runs according following steps:

1. **Damage note** - it is report, that classify incident on the equipment, for example failure according anticipated defined codes and catalogues. Note should be always linked to the technical place, and by this way there will be created source of information for following of serviceability of given equipment.

2. **Order of maintenance** - it presents working command, in which there is possible to follow managing of working activities on the equipment, planning of activities on the equipment, planned and existing cost for equipment maintenance. Order should be linked to the technical place, to the cost department and it could be accomplished according direct charging, report or annual plan of order accounting, in which cost are allocated to the equipment maintenance.

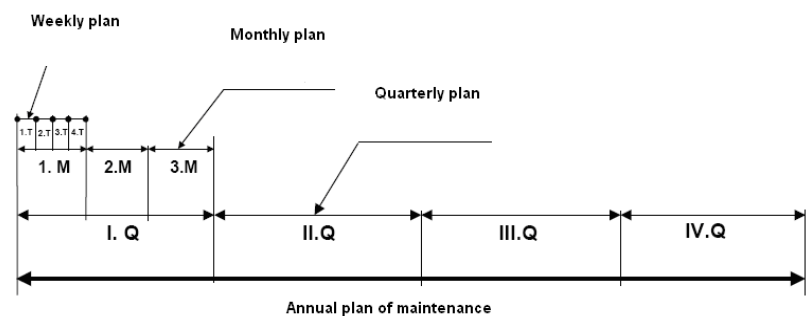


Figure 5. Plan of maintenance process

3. **Stating of annual plan for preventive maintenance** - determination of demands (according law, ordinance, and producers' decree), timing norm, and maintenance provider for concrete equipments. Annual plan for preventive maintenance is divided to the several time intervals that are weekly, monthly, quarterly. RCM access demands stating of annual plan for all equipment on every technical place.
4. **Comparing of plan with reality** - in this module there are compared planed cost for maintenance with existing cost. Information about really performed works during maintenance is reflected in the evidence according feedback reports. During cost comparison it is necessary to accept qualification to preventive and corrective maintenance. Total rate between corrective and preventive maintenance should presents 20%: 80%, that results from RCM strategy.
5. **Evaluation of plan filling** - it is made according reports, orders and performance. Plan filling is possible to evaluate from the view of planed, as well as not planed maintenance.

According performed analysis in module - Controlling there have been finding discrepancies of planed and existing values, with consequences in following facts:

- Low using of working available time for maintenance workers.
 - High rate of corrective maintenance in area of machine maintenance - removing of failures.
 - Lack of workers for preventive maintenance.
 - Not filling of plan for preventive maintenance.
 - Technical shortages on equipments during preventive maintenance.
 - Not sufficient coordination of works during maintenance.
 - Not possibility to improve dead-line for preventive maintenance during the year due to the objective reasons.
6. **Measurement suggestion for removing of discrepancies in plan** - there are stated in maintenance order according detected facts:
 - Increasing of process effectiveness for evidence of not presented workers in working place.
 - Securing of maintenance coordination by working positron - maintenance coordinator.
 - Operative dividing of maintenance workers for preventive maintenance.
- Improving of dead-line for preventive maintenance in the system due to the objective reasons.

CONCLUSIONS

Controlling is a new instrument for the firm and by the controlling we can manage all the processes in the firm. Controlling is power of information about maintenance activities in the selected firm. By the controlling the firm reduces maintenance costs and it improves all activities of maintenance process. We can say that the utilization of controlling brings a lot of advantages for the firm. By the controlling system in the firm we monitor all activities of maintenance process, all people on this department, material, standing time, quality, productivity, costs, safety, functionality of machines, reasons of standing time. These arguments are confirmation of utilization Kaizen approach. Kaizen presents improvement. This firm improved maintenance process and improved too economical indicators.

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