Chapter 9
Model of a Performance Measurement System for Maintenance Management

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ABSTRACT
This chapter book will analyze different systems of indicators by which maintenance management is evaluated. The models analyzed are: 1) The Balanced Scorecard. 2) The Alsyouf Model. 3) The Maintenance Scorecard Model. 4) The Metrics for Maintenance of SMRP (Society of Maintenance and Reliability Professionals). 5) The EN-15341-Maintenance Key Performance Indicators (European Standard). This paper presents a model for indicators based on various hierarchical levels and different functions and processes taking place in a maintenance department. With this model a comprehensive assessment of the most important aspects at all levels of the organization is achieved and shows the relationship between the various indicators to understand the overall performance of maintenance management and so align departmental objectives with the strategic objectives. Also is developed the C-KPI-M model, which is the definition of 18 chains of key indicators for viewing the cause and effect of the maintenance KPI that contribute to achieving the maximum Economic Value Added (EVA).

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INTRODUCTION

In many companies the maintenance departments perform management control based on a list of indicators that, in principle, are necessary and important to verify the level of performance resulting from the maintenance management. The problem with using indicators in isolation, without knowing the cause and effect indicators for different functions and hierarchical levels, you do not have a comprehensive view of both operational performance and financial management system. Another problem of not having a system of performance measurement is that those responsible for carrying the indicators, are often unaware of the applicability and the importance of calculating certain causing discouragement in the performance of their duties indicators. Therefore, it is necessary that a system of indicators for maintenance management where everyone involved understands the importance and impact of the function it performs in the overall results of the company is formalized.

The model of a system for maintenance management indicators proposed has its foundation in the basic organizational structure, which in our view, should have all maintenance department and its relationship to the highest hierarchical level or senior management of any industrial organization. A functional analysis is performed to define indicators tactical-operational level and model of Balanced Scorecard is used to define indicators in the strategic and corporate levels.

SYSTEMS FOR MAINTENANCE MANAGEMENT INDICATORS

To measure the performance of maintenance management, a set of indicators to measure different aspects of the management process is used, the most common reflect the performance of the equipment and the costs of maintenance. These two types of indicators are clearly lagging indicators and indicate the status after the action has taken place. For this reason, you should design a system of indicators that includes preventive actions to avoid undesirable results.

Indicators should be formulated for the different levels of the organizational structure and for each level, indicators have specific purposes for specific users.

Users at the highest management level relate to the overall administrative performance, while those in the functional levels are related to the physical condition of the assets. The use of multiple indicators of performance levels of systems and subsystems helps solve problems. If a corporate indicator shows a problem, then lower level indicators should define and clarify the cause of the weakness that has caused this problem. The relationship of the indicators at different hierarchical levels with business goals is vital to the success of a program of physical asset management.

It is shown below the basics of five models of systems management indicators that are widely used to measure the performance of maintenance management and constitute the conceptual basis of the model presented here.

The systems in question are:

1. The Balanced Scorecard (BSC)
2. The Alsyouf model (BSC adapted)
3. The Maintenance Scorecard (MSC)
4. The system of indicators of SMRP
5. The system of indicators of EFNMS