

# Support Process Aligned With a Maintenance Management Model

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## **EXECUTIVE SUMMARY**

*Most companies focus their thinking on the production system's assets, those that generate profits, and rarely look to the periphery, to the enabling systems, those that carry out the effort in order that the production department can continue to do its job, those that provide the "support" to the system. What is "supportability"? It is not a widespread term; it is in fact associated to "maintenance logistics," and this is only the simplest of its meanings, when in reality it crosses horizontally the whole organization, it is transversal to the MGM model, and it is present in all of the phases of assets and systems' life cycle. Throughout the chapter, different concepts will be developed to show how support is integrated into the proposed maintenance management model (MMM) at each stage of the asset life cycle and how it impacts their costs.*

## **INTRODUCTION**

On many occasions, within the maintenance area, questions arise that seem to have no answers or to be rhetorical, such as: "why wasn't the spare part we asked for bought?", "Why was this equipment installed against the wall if it doesn't allow to reach the filters?", "why was this equipment bought?", "with which purpose?", "Was the demand of gas the boiler requires in order to operate correctly compared to the amount of gas provided by the public service line, before it was purchased?". You can also hear statements such as: "they ask us to do the fourth level of service, but they didn't send us to do the courses and we don't even have the manuals or the specific tools!", or "the buyers didn't buy the spare part and now it's our fault!", "They bought this equipment with the original manual without translating it and I don't even understand the characters it is written in!".

## ***Support Process Aligned With a Maintenance Management Model***

The problem usually lies in the fact that companies focus their thinking on the assets of the productive system, those that generate profits, and rarely look at the periphery, the enabling systems, the teams that carry out the effort so that the production department can do its work, those that provide the “Supportability” to the system.

But, what is “supportability”? It is not a widespread term, in fact it has been associated with “maintenance logistics” and, to the author’s understanding, it is only one of its meanings and perhaps the simplest of them.

The real dimension of “supportability” must be sought in the US Department of Defense (DoD) system procurement standards. The Glossary of Defense Acquisition Acronyms & Terms of the Defense Acquisition University, corporate university of that Department, defines it as “A key component of availability. It includes design, technical support data, and maintenance procedures to facilitate detection, isolation, and timely repair and/or replacement of system anomalies. This includes factors such as diagnostics, prognostics, real time maintenance data collection, and Human System Integration (HSI) considerations” (Defense Acquisition University, 2020).

For its part, AcqNotes Defense Acquisitions points out that “Supportability is the degree to which system design characteristics and planned logistics resources meet system requirements. Supportability is the capability of a total system design to support operations and readiness needs throughout the life-cycle of a system at an affordable cost. It provides a means of assessing the suitability of a total system design for a set of operational needs within the intended operations and support environment (including cost, equipment readiness, and manpower and personnel constraints)”. (AcqNotes, 2020)

It can be seen a priori that Supportability runs through the entire organization horizontally, is transversal to the Maintenance Management Model - MMM (Parra, C y Crespo, A, 2015) and is present in all phases of the Life Cycle of assets and systems.

Supportability runs horizontally throughout the organization and is present in all phases of the Life Cycle of assets and systems. Regarding the MMM Model represented in Figure 1, the support is developed and operates embedded in each of its Phases, as it will be presented later.

The following is a simple and practical presentation of the proposed generic Maintenance Management Model, which considers and integrates many other models found in the literature to date, or those used in practice in companies with a long tradition and excellence in this field. The proposed Maintenance Management Model is composed of eight blocks (Figure 1), which distinguish and characterize specific actions to be followed in the different steps of the maintenance management process. It is a dynamic, sequential and closed-loop model that attempts to characterize precisely the course of actions to be carried out in this management process to ensure its efficiency, effectiveness and continuous improvement.

As indicated in the reference figure of the MMM, the first three blocks determine the effectiveness of the management, the following blocks ensure its efficiency and its continuous improvement as follows: Blocks 4 and 5 include actions for the planning and scheduling maintenance, including of course planning the capacity of the maintenance department. Blocks 6 and 7 are dedicated to the evaluation and control of the maintenance and cost of assets throughout their life cycle. Finally, block 8 focuses on actions to ensure continuous management improvement.

Next, we will briefly introduce each technique and discuss how it can be most helpful to the decision-making processes that take place at each stage of the process. In this way, we also characterize the support structure of the Maintenance Management Model:

**Phase 1. Techniques to define the maintenance management strategy.** In order to ensure that the operational objectives of maintenance and the strategy are consistent with the business’ general objec-

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