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WORLD CLASS MANUFACTURING AS A NEW MANAGEMENT METHOD

Abstract: Nowadays, people have many methods and tools management to apply in companies. One of the most popular management method is World Class Manufacturing, especially applied in automotive industry. This paper focus of two pillars of World Class Manufacturing method. Early Equipment and Product Management are the most important technical pillars. The main objective of EEM is reducing the life cycle costs furnishing, for EPM are reduces costs and improve quality. In the article example of costs reduces solution was described. The example concerned of LEHA pump, exactly reduction of water consumption for production. Applied improvement and modernization of LEHA pumps on the production line at the company made it possible to achieve the objective pursued by EEM and EPM.

1. Introduction

XXI century is a period of global competition increase in the global industry, especially in investment products groups like machines, devices or complete installations.

Competitive actions between companies are and still will be carried in a global manner.

The use of new techniques, technologies or various methods of management leads to the efficient and effective functioning of the company [1].

Implementation and use of various techniques, methods and tools enables the development of new and competitive strategies to build a strong market position.

World Class Manufacturing (Fig. 1), abbreviated to WCM is a method, which assumes a goal of developing an excellent standard of plant organizational system to achieve world-class competitiveness [1].

The necessary elements for the implementation of WCM are [1]:

- Knowledge to eliminate losses;
- Involvement of employees, who having motivation and desire will undertake various tasks and solve problems;
- Knowledge of WCM that needs to be converted into concrete action;
- Proper selection of the right people and good cooperation are the way to achieve common goals.

The most important technical pillars in the management are [1]:

- Early Equipment Management,
- Early Product Management.

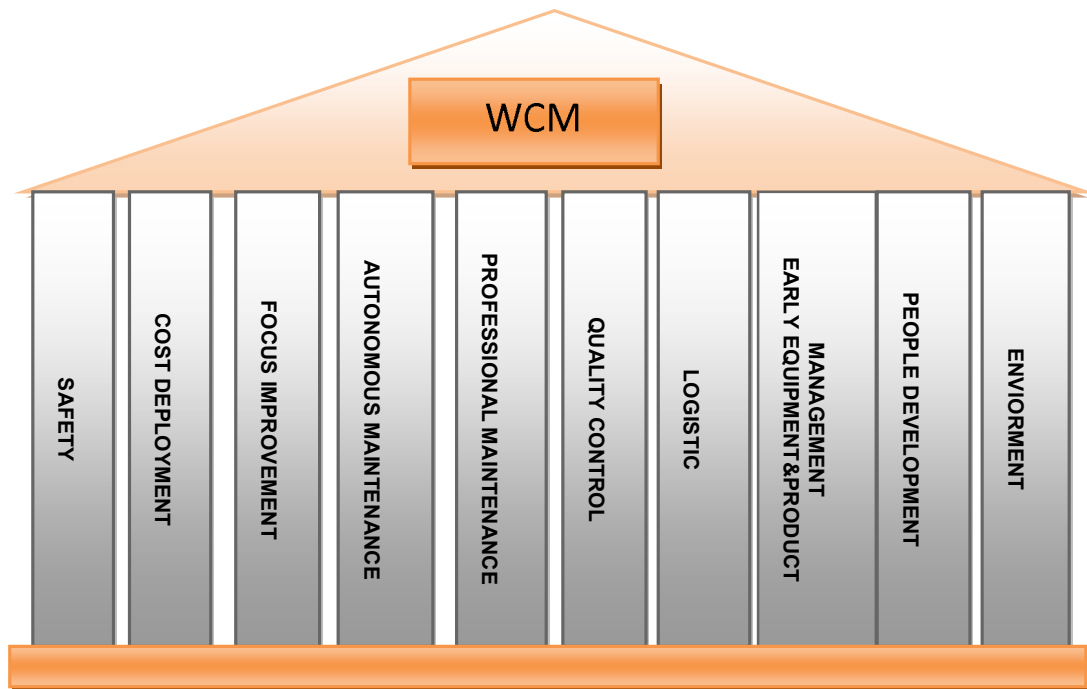


Fig.1. Schematic of ten technical pillars of WCM [1]

2. EEM & EPM

Device management at the plant usually has many problems: difficulty in manufacturing, difficulty of maintenance, creation of quality defects that cause the need for repair.

These problems increase the costs: initial costs and operating costs of equipment, labor costs, maintenance, the lack of quality and costs of losses resulting from failures [2].

EEM methodology aims to create competitive devices through the ability to anticipate problems that may arise in these devices. It is possible by taking into account in the design of new machines everything that you learned experience gained during previous machines, both in the commissioning phase of production and operation [2].

The objective of EEM is: reducing the life cycle costs furnishing, the device reliable, the unit easy to maintain, the device is available, easy to control and clean, the device safe, rapid launch of new devices, high quality product [2].

Product management is the process of designing, creating, implementing and managing the life cycles of product or service. The whole process is necessary in order to create a product which satisfies the demands posed [2].

The main purposes of EPM are: improves quality, reduces costs, improves: sales volume, profits, sales lifecycle, overall product program profit.

In order to regulate actions to achieve three basic EEM elements (quality assurance, maintenance and cost reduction) the EEM project is realized in seven steps: planning, initial

project, detailed project, constructing, installation, preliminary production, implementation [2]

3. An example

In July 2012 was established a team intended to develop the ability to limit water consumption. After collecting and analyzing the data LEHA pumps were indicated, as the site of the largest water consumption on oil Processes Department (Fig. 2). Average water consumption LEHA by two LEHA pumps per year is more than 23,000 m³ [4].

As part of the upgrading analyzes involving the use of water in the circuit it was diagnosed a considerable amount of repairs on one of the process machine. The analysis of the repairs cost including spare parts connected machine failure. The analysis of the most common reasons for failure – frictions of pump members and emerging holes in the bodies, the vacuum decrease, unplanned shutdowns of lines, time to replace three hours, significant costs, lack of continuity of production. The Analysis of the failure cause- material used for the construction of pumps [4].



Fig. 2 The LEHA pump[4]

4. Solution

The detailed analysis of the phenomenon indicated as a cause the material used to produce pumps. Distance sleeves of the pumps were made of cast iron [3,4].

Table 1 The Kaizen solution of the problem with pumps[3,4]

Department	Line	Machine	Submitted by	Shift	Date	HACC	Confirm
Rafineri	Desme		Gaj Marisz		15.11.201	P	
BEFORE		AFTER					
<p>PROBLEM</p> <p>LOSSES LEHA pump for repair, big material losses were noticed on a distance sleeve. This element is exposed to aggressive fatty acid.</p>		<p>SOLUTION</p> <p>PROFITS</p> <p>I propose to exchange cast iron distance sleeves in acid resistant or stainless steel ones</p>					
<p>Not planned line stoppage in case of leaks(vacuum decrease)</p>		<p>List the possible benefits of this solution for you and the company Longer functioning time of the pump. Assure continuous production</p>					

Implementation of the pillars of World Class Manufacturing (WCM) and the use of appropriate tools is a way to improve the economy of the entire enterprise. The results of analyzes on the use of an approach based on EEM and EPM in the company concerned the reduction of water consumption for production. Applied improvement and modernization of LEHA pumps on the production line at the company made it possible to achieve the objective pursued by EEM and EPM.

References

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2. Lebuda A., Roszak M., Nowosielski R.: Appraisal of the effectiveness of chosen management processes, " International Journal Materials and Product Technology, 2015, Vol. 50, Nos. 3/4, pp. 319-339.
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4. Materials from automotive production plant (official data: Figures 2 and Table 1).