A Standardized Work Methodology To Increase Manufacturing Productivity

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Abstract: The present document explains the application of a standardized work methodology to identify, measure, and improve shop floor operations, as an effort to increase productivity levels at a global company, located in Monterrey, Mexico. From the lean manufacturing perspective, the relationship between waste elimination and productivity increase, supported by diverse manufacturing techniques, represents the major concern for achieving a one-piece flow system, as it is described in this paper. The assessment of several potential operating scenarios was done with the help of discrete simulation models. Results of the system implementation are also given.

Keywords: Productivity, standardized work, work-in-process, one-piece flow, waste elimination, cellular layout, kaizen, synchronization of operations, takt time.

1. Introduction

The development of manufacturing strategies to achieve high efficiency standards and continuous improvement on the shop floor operations has been a challenge for companies during the last decades. These are required to maintain their competitiveness in a day-to-day dynamic environment. Effective cost reductions in manufacturing by eliminating waste, enables factories to have a better resource management that guarantees the accomplishment of a sustaining throughput goal. The importance of focusing on key process indicators and operation performance measurement and control, is becoming decisive for the company’s short and long term operational success.

This document presents the necessity of increase productivity as a problem of concern, in a manufacturing work cell. The identification and elimination of bottlenecks through the different process stages has been treated in the literature. The interest of improving efficiency in operations and the throughput goals, are important issues well known and treated by lean manufacturing and just in time bibliography. The application of a one-piece flow system is suited to situations where the shop floor operations are non-synchronized or when they lack of a standard work sequence to uniform the pieces that flow through the work cell, causing excessive performance time and generating additional costs, while the companies try to accomplish the manufacturing of the demanded quantities without wasting resources of any kind.

The content of this paper, describes how to accomplish the production ramp up goal according to the new takt time, and has been divided in four parts: first, a brief review of related literature at the next section, followed by a description of the steps used to identify opportunities for waste elimination and efficiency increase in the work cell, explained in the third section. Section four, describes the application of the previous steps, finishing on section 5 with the resulting conclusions of the described approach.

2. Research

One of the most analyzed problems in manufacturing, is the need to increase efficiency ratios at the shop floor, improving an area, process, or work standard and impacting directly in a company’s cost reductions, highest quality and the lead time reductions; becoming more productive. Lean manufacturing, provide tools to maintain the standards and ensure the improvements.

Henry Ford, in the 1930s, transformed the way manual factories worked when he designed a mass production system to manufacture automobiles. Further, in the same industry, after the World War II, Toyota’s successful company efforts, lead by Taiichi Ohno, defined seven types of waste (muda) commonly presented in processes that needed to be eliminated: Mistakes on products identified as defects, overproduction of goods not yet ordered, goods causing excessive stocks, waiting on the products expecting to be processed, unnecessary labor motions, excessive transportation, and excessive processing (Ohno, 1988); all of these are still measured by many companies these days with the objective of making their operations more efficient and controlled (Womack, 2005).