

## LEAN MANUFACTURING OVERVIEW

### Lean Manufacturing

Lean manufacturing represents a journey that should never end because it involves the identification and elimination of waste, and the continuous improvement of all operations involved in any form of work. It is well-known fact that the implementation of **Lean** production systems has saved some companies millions of dollars over the last 20 years or so. The fact is that not every manufacturer has converted to a **Lean** system years ago remains a mystery to many because the rewards are so amazing. It seems that people are skeptical and not prepared to invest in themselves even though some of the **Lean** principles cost very little money to implement.

### Helping Ourselves

The way we can help ourselves is by applying Lean Management and Lean Manufacturing resources to become more efficient in how we use people, material, and manufacturing processes. The waste in these three areas can amount to as much as 35% of a company or organization's revenue. If this money were reinvested in new technology and processes, it would increase a company's productivity and make them more competitive globally. Isn't it about time that we started to help ourselves instead of lobbying for taxes about imports or some form of restrictions against foreign goods? The truly **Lean** companies will survive in the global battle for customers and bottom-line profits. Naturally there will be those who will probably resist the changes as some are doing presently, and gradually fade away.

### Lean Principles and Tools

**Lean** principles involve many different ways we can become more efficient by *working smarter and not harder*. A few of the **Lean** methods that follow will provide a brief explanation of how they can assist us to operate any type of operation leaner and more efficiently.

1. **Cellular Manufacturing** is a system that helps build a variety of products from a part family with as little waste as possible. A number of machines, work-handling equipment, and people are arranged for a smooth flow of materials and parts through the process.

Cellular manufacturing helps to create a concept known as single or one-piece flow. Equipment and the workstations are arranged in sequences that allow for a smooth flow of materials and components through the process. The cell is made up of the workers and the equipment required to perform the steps in creating the product. The layout of the equipment and the workstations is determined by the logical sequence of production.

**2. Continuous Improvement (Kaizen)** is a process of on-going improvement that involves everyone – management, supervisors, and workers to improve operations and reduce costs.

Transforming a factory into a Lean manufacturing operation is a gradual process that can be described as a journey rather than a destination. The journey to Lean is an ongoing one; it requires a strong commitment, an appropriate organizational structure, and just plain dedicated work. In Lean manufacturing, this change for the better can result in gradual improvement of products, workplace efficiency, customer service, and reduction of waste.

**3. Pull/Kanban Systems** - the pull concept in Lean production is to respond to the needs of the customer so they know they can get what they want, when they want it.

Lean companies design their operations to be more responsive to the varied and changing needs of their customers. Lean companies that are able to create such an operation can avoid the more traditional batch-and-queue method, which is generally acknowledged to be the worst way to process material through a factory. A more continuous flow results in items being moved immediately from one workstation to the next as soon as they are ready.

**4. Total Productive Maintenance (TPM)** is a program for making the effectiveness of all manufacturing equipment as reliable as possible. The goal of TPM is to prevent breakdowns and defects, but to do it in ways that are efficient and economical.

The importance of Total Productive Maintenance (TPM) cannot be overlooked because it plays such an important role in the effectiveness of Lean manufacturing. As in personal health care insurance, TPM may be considered the health care of our manufacturing machine and tools which are required to effectively reduce waste and run an efficient, continuous manufacturing operation, business, or service operation. The cost of regular TPM is very small when it is compared to the cost of a major breakdown.

**5. Value Stream Mapping** is the actions (value added and non-value added) required to bring a product's production path (materials and information) starting from raw materials and into the customer's arms.

Value Stream mapping is a technique for analyzing material and information flow; it helps provide an overview for improving the manufacturing system. The VSM approach works to try to improve the whole process, not just optimizing the parts or cherry picking (taking too narrow a view). It is basically a flow-charting technique that uses icons to represent activities and locations.

6. Workplace Organization (5S) - **Lean manufacturing cannot succeed in a workplace that is cluttered, disorganized, or dirty.** Many companies today are working on the 5S system that consists of effective workplace organization and standard work procedures that are favorable to Lean manufacturing principles.

The workplace environment is important in helping to introduce Lean manufacturing. An untidy or disorganized workplace can lead to wasted energy, whether it be avoiding obstacles or searching for materials and tools.