

## **Importance of Material Handling in today's Scenario:**

Material Handling embraces all the basic operations involved in the movement of bulk, packaged and individual products in a semisolid or solid state by means of machinery and within the limits of a place of business

Material Handling is directly related to productivity, efficiency as well as cost effectiveness.

The objectives of Material Handling are further defined as :

- Increase efficiency in the material flow .
- Improve facility utilization
- Improve safety as well as working conditions .
- Facilitate the manufacturing process faster.

All the above at reduced cost would automatically take care of the productivity.

And why not? **Material handling can account for 30-75 % of production costs and can reduce operational costs by 15-30 %!!**. Hence it does become an obvious area of focus for any productivity enhancement and cost reduction movement .

Following are the principles of Material Handling System Design and Link to productivity. The 10 most important principles used today in the field that will help in the establishment of efficient material handling systems and also in assessing the ones that require improvement are :

### **PLANNING PRINCIPLE :**

Choice of material handling equipment should be the result of a structured unit of specific course of action i.e., a plan to determine what material and how much needs to be moved, when and where it will be moved, and how it will be done.

### **STANDARDISATION PRINCIPLE :**

Methods, equipment, control devices, and software should be standardized without reducing the level of performance and the need for flexibility.

### **WORK PRINCIPLE :**

Material Handling flow should be kept to as minimum as possible within the requirements demanded by the effectiveness and efficiency of a Material Handling system. "The best flow is no flow."

### **ERGONOMIC PRINCIPLE :**

Material Handling activities should be designed and proper equipment chosen after taking into consideration human capabilities and limitations to enhance the level of safety and working conditions .

### **UNIT LOAD PRINCIPLE :**

The amount of Material to be moved or stored as a unit should be sized and configured according to the specific needs and objectives of the Material Handling facility.

### **SPACE UTILIZATION PRINCIPLE :**

The cubic [volumetric] space should be used as effectively and effectively as possible.

### **SYSTEM PRINCIPLE :**

A Material Handling system consists of a collection of elements working and interacting together as a unit to perform a common function .

### **AUTOMATION PRINCIPLE :**

The level of mechanization and automation depends on the operational requirements and financial capabilities specific to each situation.

### **ENVIRONMENTAL PRINCIPLE :**

Environmental impact and energy consumption should be important factors in the selection of a material Handling system.

### **LIFE CYCLE COST PRINCIPLE :**

In the economic analysis of a material Handling system all cash flows need to be considered along the service life of the system.

**Improvements of between 30 % and 70 % in overall efficiency are considered normal after a correctly structured optimization exercise.** This is in addition to the potential advantages to be obtained in such areas as stock levels and improved production output. Productivity benefits of such improvements are:

- Reduced Stockholding .
- Improved stock accuracy.
- Improved stock visibility.
- Reduced cost of material handling process.
- Reduced reaction time .
- Improved order fulfillment.
- Speed and accuracy
- Improved production OEE from improved material availability.
- Higher storage utilization.

### **3 'R' s to be considered prior to investment in Material Handling Optimization.**

By following three simple concepts, Plant managers can realize the significant cost savings from material handling systems and equipment.

Most plant managers grapple with the question –how do you reduce costs without hurting output? One answer lies in optimizing current material handling system and equipment By following a few simple steps, plant managers can prolong service life, minimize downtime and cut capital expenditures. These strategies fall under three easy –to remember approaches –reduce, reuse and recycle .

**RECYCLE :** To keep equipment running at peak capacity and thus reduce inefficiencies, managers should implement a performance audit and adopt predictive, instead of reactive, maintenance. These two strategies allow managers to maximize current material Handling systems and equipment without accelerating wear and tear or driving up maintenance costs.

The first strategy –a performance audit –represents the most effective, yet underused, way to gauge how efficiently systems are running. In particular, it can reveal if your requirement is functioning properly or if it requires a tune-up. With an audit, you can find out how well system operators are doing and whether they

need extra training. Additionally, you can ascertain if your material handling equipment is still meeting the plant's needs and get an idea of the system's overall performance.

A performance audit can help you zero in on productivity drains, evaluating such areas as picking, queuing, staging and sorting rates. A complete audit will analyze system from both an operational and functional standpoint, including a final report detailing recommended adjustments. Thus, managers can pinpoint and fix inefficiencies, realizing cost savings from improved productivity rates and system performance. Reliable and cost-effective, predictive maintenance is another way to get the most out of material handling systems and equipment. It can help you determine when components will fail so you can do corrective work on them before they break down. In particular, it allows you to set baseline failure rates over time. Thus, you can keep systems running at peak efficiency and avoid the high cost of malfunctioning equipment including downtime for emergency fixes and hefty replacement expenses for components beyond repair. As a result, you can cut expenditures on equipment overhauls and maintain your capital.

### **REUSE:**

To reuse existing equipment and avoid the high cost of replacement, consider retrofitting, which can boost efficiency by 15-20 % or more. By retrofitting, plant managers can allow systems to function beyond initial capacity limits and to satisfy increased production demands. It can involve incorporating new technology, upgrading components or increasing capacity and often represents as a feasible solution as many new technologies work well with older models.

Plant managers material handling systems and equipment can choose from a number of solutions. For example, they can opt to add adaptive control systems or broaden access to real-time operational data. They can also choose to incorporate volume and weight data for checking and invoicing or integrate sophisticated induction and sorting capabilities. Additionally, managers can perform the retrofit in-house, with illustrated step-by-step instructions, or outsource in to service professionals.

By retrofitting equipment instead of replacing it, managers can enjoy considerable saving. For one thing, the cost of repurposing equipment is often less than 60% of a new machine's cost. Moreover, by retrofitting and modernizing equipment, managers can boost its reliability and renew its service life. They can also improve production cycle times and cut maintenance and operating expenses.

Furthermore, by retrofitting, managers can ensure compliance with current federal and state safety regulations, thereby helping reduce work-related injuries and insurance premiums, including compensation for workers. Finally, a retrofit allows for parts standardization, further trimming costs as well as making parts easier to replace.

**Recycle :** instead of purchasing new equipment when production requirements change, plant managers can buy remanufactured equipment. They can thus take advantage of lower capital equipment costs, as remanufacturing retains much of the original item's value while removing a big chunk of new equipment overhead, from material costs to transportation. Indeed, the remanufacturing process- disassembling, cleaning, replacing non-working parts, refinishing and reassembling requires less labour, energy and resources than purchasing new equipment. What's more, remanufactured equipment often offers the same warranty as new machinery. Aside from offering substantial savings, purchasing remanufactured equipment also benefits the environment. By opting for remanufactured instead of new machinery, plant managers are helping to reduce the following- the amount of raw materials going into the waste disposal stream, materials disposal-related costs, and the volume of industrial solid waste headed for landfills.

**The three R's:** In short, by reducing, reusing and recycling, plant managers can realize considerable cost savings while boosting the ROI from material handling systems and equipment. While managers must understand that these strategies can't push back new capital expenditures indefinitely, these tactics represent effective ways to get the best performance and value out of materials handling systems. By following these three R's, managers can gain months or even years of prolonged service life at lower cost.

**Productivity gain from Material Handling Equipment can accrue on three counts.**

- 1) Appropriate, economic and efficient choice of Material Handling Systems.
- 2) Lean and flexible process design, with focus on elimination /minimization of Non Value Added activities. Thus requirement of material handling is minimized and where inevitable, is done efficiently
- 3) Maximize availability of Material Handling Equipment through effective maintenance practices. Good choice of equipment and lean processes will be futile if the equipment fails to be “available for productive purposes.