
MANUFACTURING: 80% HANDLING, 20% PROCESS

We usually think of manufacturing as a group of machines cutting or forming materials, or large assembly lines turning out cars or refrigerators. We speak of plant operations as "manufacturing processes", creating a perception that most of the activity is process related. In fact, in any manufacturing plant, the handling elements usually outnumber the actual processes. The distribution of activity is not always exactly 80% handling and 20% process, but these figures are a good representation of the importance of each of these elements in a manufacturing operation.

To illustrate this, think of a hypothetical facility where air compressors are made. The company buys all the components from outside sources. Although some are in finished form and can be directly assembled into the finished product, most are rough castings, forgings or bar stock requiring further machining and finishing before they can be assembled into compressors. The principal processes of this plant are machining, painting, assembly and testing.

Material is received from the vendors. It is stored in a warehouse, and is released to manufacturing on demand. As it is needed the material is moved to the first machining center. It is taken from a container or cart, and loaded onto a machine. The machine performs a specific metal cutting operation. The part is then unloaded from the machine and carried, either manually or mechanically, to the next work

station. This process continues until the part is completely machined and ready for sub-assembly or painting. All parts go through a similar process. Parts requiring painting are loaded onto an overhead chain conveyor which moves them along as the painting is done. Some machined and painted parts go through sub assembly operations. Finally, all parts and sub-assemblies are put together to form a compressor unit on a floor slat conveyor, which moves material through various assembly stages. Finished compressors are moved to test areas, tested and boxed. These are then moved to the finished goods warehouse for storage until they are distributed to customers. Usually after each major process area - machining, painting and sub assembly - there is work-in-process storage, which is purely a handling function. Even some support services such as tool cribs are mini warehouses.

We can break this operation down into its process and handling functions as follows:

PROCESS COMPONENTS

- Machining
- Painting
- Sub-assembly
- Assembly
- Testing

HANDLING COMPONENTS

- Receive raw material
- Put away and store raw material
 - Pick raw material on demand

- Move raw material to ws#1
- Load material onto machine
- Remove part from machine
- Convey part to ws #2
- Load part onto machine
- Unload part from machine
- Work-in-process storage
- Move to sub-assembly area
- Work-in-process storage
- Load component onto floor slat conveyor for assembly
- Remove compressor from conveyor
- Move to test area
- Crate or box finished compressor
- Move compressor to finished goods warehouse
- Put away and store compressor
- Distribute to customers

Executives tend to allocate more resources to process improvements than to handling elements, even though they are aware of the significance of handling. Why? Process improvements are easier to measure in terms of specific increases in output, and thus are easily justified. By contrast, improvements generated by better work flow, handling and storage methods are less tangible, and are harder to measure in terms of output.

Improvements should be made to most handling operations. These improvements can be measured by increased overall productivity, and their impact can be greater than manufacturing process improvements because they account for a greater percentage of time and manpower in the total operation.

The ideal time to improve work flow, layouts, material handling, and storage methods is when a company expands, relocates, or starts up a new facility. Management is usually more receptive to improvements and the associated investments at such

times.

To take full advantage of this opportunity you must be prepared to devote a group of people with special analytical skills, and familiarity with a broad range of equip-

ment and techniques to study the entire operation for weaknesses, and recommend improvements. The time and investment involved are quickly and easily repaid by the greater efficiency you can achieve.