Case Study

SIMULATION

CLIENT:

A pharmaceutical manufacturer and distributor had outgrown their old facility and was currently in the process of designing a new state-of-the-art, paperless distribution center.

DESCRIPTION OF OPERATION:

The company manufactures small vision products that come in two pack sizes. Most of the orders are picked using automated order picking devices called A-Frames. Orders for items with medium movement are batch picked from horizontal carousels with computer controls and pick-to-light displays. The completed orders are then routed towards, semi-automated packing stations where they are arranged according to magnification, packed into shipping boxes, and then conveyed to the respective carriers.

OBJECTIVES:

Before investing an exhorbitant amount of capital, management wanted to know if this proposed picking system would work. Gross & Associates was retained to evaluate whether the conveyor system would be able to support the projected high volume throughput. In addition, the client wanted to test alternative picking strategies and to determine the best combination of picking systems. They also wanted to know the number of picking totes to feed into the system to ensure constant work flow without creating bottlenecks.

METHODOLOGY:

Gross & Associates suggested a computer simulation study of the proposed conveyor system. A simulation model was created to follow the structure of the actual operation. Statistical distributions of actual data were used as input into the model. Statistical outputs at the end of the simulation runs provided insight into the performance of the system. Animations of the simulation runs revealed the location of system bottlenecks.

RECOMMENDATIONS:

Gross & Associates recommended the following:

1. Eliminate the horizontal carousel picking system and distribute more orders among the A-Frames. The use of carousels slowed down the system to the point that it could not process the required number of orders for the day.
2. Recirculate 800 to 1,000 totes. More totes led to increased conveyor congestion, while fewer totes increased the time required to complete a day's worth of orders.
3. Divert completed ordes to the closest open packing station and maintain a working queue of at least one tote per packer to keep congestion in the packing loop minimal.
4. Eliminate an on-line feed station for the shipping boxes because it delays the order's movement down the system.
5. Install either high-speed conveyors or multiple conveyors at a lower speed to transport totes to the five A-Frames.

RESULTS:

Without simulation, the company would have installed millions of dollars of sophisticated equipment, only to realize that the system would not be able to perform at the desired level. With simulation, however, necessary equipment modifications were identified before any physical implementation. In addition, management was assured that the system would be able to deliver the projected order throughput. The capital for the project was approved and the building is now under construction.

Compliments of:

Gross & Associates

Corporate Headquarters
167 Main St.
Woodbridge, NJ 07095
Phone: (732) 636-2666
FAX: (732) 636-2799
info@grossassociates.com