



Bag-In-Box Food Packaging Line

PROJECT SUMMARY

This simulation model was developed to improve the existing production facilities for one of the world's leading producers of ready-to-eat cereals. Plant management had formulated some process modifications and wanted to objectively evaluate the effects of each one. By using a simulation model, plant engineers were able to see the effects of the aforementioned changes in their model before they were introduced into the actual plant system.

SYSTEM DESCRIPTION

The packaging line consisted of the following operations:

- 4 baggers
- 1 cartoner
- 1 accumulator
- 2 case packers
- 2 case lifts

In the current system, product was fed into bagging machines where it was discharged into plastic bag-type containers. The bags were then transported to a cartoner that inserted the bags into individual cartons. Once boxed, the product was fed to an accumulator that grouped the cartons and fed them to case packers. The case packers inserted the group of individual cartons into a case for shipping. The filled case was sealed and removed from the system by a case lifter.

OPPORTUNITY

The main objective of the study was to understand the behavior of the existing packaging system and to assist in designing a new and more efficient one. First, a base model, operating under original specifications and parameters, was developed for evaluation. Then, alternative scenarios and suggested system modifications were modeled and evaluated to determine the optimal line configuration.

APPROACH

The simulation objective was to determine if overall throughput requirements could be met or improved. The next objective was to determine under what conditions, and the proper line configuration that would allow throughput goals to be achieved. Therefore, the model needed to:

- Identify bottlenecks and determine the level of resources necessary to achieve production targets.
- Provide accurate, objective, quantitative information to improve the process and increase productivity.
- Help plant engineers gain insight into developing a control strategy for the system by understanding its logical operation.

SOLUTION

Several scenarios in the packaging system were evaluated to determine a configuration that would optimize system throughput. One system modification suggested that the same production efficiency could be achieved by removing a bagging machine from the packaging lines. However, when only one case packer was used in the same system, throughput decreased. Current system difficulties could be resolved by modifying the system configuration, or by increasing the speed of the conveyors.