

Appliance Manufacturer Implements an Effective Assembly Process Schedule

Company Overview

A major manufacturer of household appliances.



Problem Description

A major manufacturer of household appliances wanted to redesign a significant portion of its refrigerator-liner final assembly process, as well as create and implement an effective and appropriate production schedule for that process.

Key Objectives:

- Determine the optimal amount buffer space for liners.
- Locate additional floor space for new equipment purchases.

Solution Challenges:

The system under evaluation produces various sizes of refrigerator liners; transfers those whole liners to an area where they are cut, taped, and pressed; then transfers them to an insertion area. Limited resources require that the appropriate mix of liners enter the “press” area to maximize system equipment since changeovers require significant time. A buffer area prior to the press area provides the space to “bank” liners for later use during off-shift or slow production due to upstream failures or bottlenecks. More buffer space was needed for overflow storage and additional floor space had to be located for new equipment purchases. The company was willing to invest a significant amount of equipment and manpower staffing to a plant redesign; however, the amount of equipment and manpower was not known. RSConsulting Application Services was asked to provide a workable and affordable solution.

Solution Discussion

RSConsulting developed a user-friendly simulation model using Rockwell Software's Arena® simulation software. The highly-detailed model evaluated the dynamic flows of products through the system, evaluating material handling as well as production operations. The high level of detail was required to capture the system sensitivities for the production operations in the system. The analysis clearly showed the amount of buffer space that was required for various production scenarios and for multiple equipment layouts. A detailed animation of the system provided validation of the model by displaying each liner as it traversed the system (and system bottlenecks), as well as the dynamic status of the buffers.

Results

By running an anticipated production schedule, RSConsulting was able to find a design with the minimum system resources necessary to meet production goals. Various cost tradeoffs were calculated with the model, balancing equipment and conveyor costs versus production throughput and volume.