PepsiCo-Frito-Lay: Ergonomic Analysis of Manual Material Handling System

Overview
Fourteen newly installed automated case erectors provided a consistent flow of cartons throughout the production line. However, the repetitive motions of loading and unloading of the cases has exposed physical risk factors leading to musculoskeletal disorders and fatigue. These ergonomic issues have resulted in lost time and workers compensation costs for the plant. Ergonomic risk assessments were used to analyze the current process and to show how the solutions reduce the problem.

Objectives
The goal of this project was to reduce the operators’ efforts by decreasing forces of lifting, pulling, and pushing of the cartons. Additionally, the objective was to lower costs by identifying bottleneck areas and by working towards eliminating workers compensation costs.

Approach
- The current process was analyzed and time studies were conducted on the operators.
- Ergonomic assessments, specifically CTD risk index and job risk assessments, were completed.
- Multiple proposed solutions were generated based on risk results.
- Feedback was obtained from the sponsor regarding constraints of the plant.
- New proposed solutions were suggested according to the feedback.
- A palletizer design, the PalletPal Roll-On Level Loader, was selected to reduce risk associated with the lower back.
- Implementing an upstream sorting technique was also recommended to eliminate the high risk associated with the shoulders, hands, and wrists.
- The same ergonomic assessments were completed for the PalletPal and upstream sorting solutions to show results.

Outcomes
- PalletPal Solution
  - CTD risk index decreased from 2.85 to 2.744
  - Job risk assessment decreased from 41 to 35
  - Investment of $5,800 per PalletPal
- Recommended Upstream Sorting Solution
  - CTD risk index decreased from 2.85 to 1.25
  - Job risk assessment decreased from 41 to 19
  - Eliminate workers compensation costs; amounting to $42,000 already in 2015