

# Polyethylene Railcar Cleaning and Loading Bottleneck Analysis

Vertical

Manufacturing | Pharmaceutical | Healthcare | Portfolio | **Logistics** | Financial | Government | Business

Genre

Case Study

**Project Review:**

White Paper

Technology Overview

Client

Eastman Chemical Company

Situation

The Polyethylene manufacturing process at Eastman Chemical Company had been steadily improved over the past several years to the point where railcar cleaning and loading had become the bottleneck.

Several alternatives with capital costs between \$150,000 and \$500,000 were being considered to increase the capacity of the railcar cleaning and loading operations, but the usual methods to determine the most appropriate alternative were not accurate enough due to the complexity of the situation, the highly variable nature of the cleaning and loading process, and the large investment at risk, therefore simulation was the tool of choice to analyze this problem and identify the solution.

Objectives

Provide management with answers to the following questions to facilitate their decision making process regarding the most effective alternative:

- How much production increase can the railcar cleaning and loading process handle if washing and drying locations are separated by spending \$150K to add drying capacity to an existing location?
- How much of an increase in production can be absorbed before it is necessary to add washing and loading on a second parallel track at a cost of \$500K?
- As production increases, when will additional railcar loading operators be required?
- What would the effect be of reducing or eliminating drying of the plastic pellets in the silos prior to loading?

Results

The simulation model helped to determine that the two most appropriate actions to take were as follows:

1. Add pellet drying capability to the pellet manufacturing process, which allowed the elimination of pellet drying in the railcar loading silos. This reduced loading and blending (drying) time by seven hours for every two railcar loads.
2. Add railcar drying capability as a separate station from the washing station such that one railcar can be washed, while a second railcar can be dried simultaneously.

In addition, the simulation solution continues to help Eastman Chemical evaluate future changes such as predicting if and when the company will need to add washing and loading on a second track, and to evaluate the effects of changes in railroad services.

Solution

Due to the large variation in the amount of time required to clean and load railcars, and the difficulty in fitting the data to the appropriate statistical distributions, it was determined that simulation would be needed to determine the best solution from several available alternatives: adding a second track, using additional operators, moving the drying process, and/or changing the railroad schedules.

Screenshot of the Model's Graphical User Interface

