

Chemical Factory Simulation

Lucas Eduardo Pereira, Fernanda Will, Emerson Watanabe, Izabela Cristina Camargo Machado, Henrique Ewbank de M. Vieira, Rodrigo Luiz Gigante

Production Engineering Department
Facens University
Sorocaba, BRAZIL

lukas_junior@hotmail.com, fernandawill11@hotmail.com, missowatanabe@gmail.com,
izabelamachado87@gmail.com, henrique.vieira@facens.br, rodrigo.gigante@facens.br

Lean Manufacturing, Operations Management and Six Sigma Applications

Abstract

The simulation model was based on a real data of a layout in a Chemical Factory. The factory had bottleneck points along its system mainly because of the chosen layout, which had a lot of movement excess and had not a very justifiable reason for its arrangement. With the improvement, the factory was able to supply its annual demand. The discrete model was created in order to analyze the similarities between the simulation and the actual numbers found in the paper. The group recreated the layout of the production system and also the stock inventory in the Warehouse waiting for transport. The products are stannous chloride and sodium fluorsilicate. The factory receives raw material of the components everyday by an arrival schedule and, if there's a problem with the material, it'll be rejected. When they're ready, each product passes through their own production sequence and then they are both carried by a fork-lift all the way down to the warehouse. They are now inspected (2% of rejection) and put on a pallet (each pallet receives 8 boxes) to be placed on an 8x8 rack. The final products are now ready to be transported. At the end of the simulation, the results were close to the real layout proposal and there were no problems or bottlenecks identified in the model.

Keywords

Bottleneck, Layout, Simulation and Production System.

Biographies

Lucas E. Lucas is a Manufacturing Engineering student, currently at the 7th semester. He also develops a Based Agent Simulation for garbage collection for an undergraduate research at the moment.

Fernanda W. is a Manufacturing Engineering student, currently at the 7th semester.

Emerson W. is a Manufacturing Engineering student, currently at the 7th semester.

Izabela C. is a Manufacturing Engineering student, currently at the 7th semester.

Henrique Ewbank de M. Vieira is Professor in Industrial Engineering at Facens University, Brazil. He has a PostDoc in Environmental Sciences from Paulista State University, Sorocaba, Brazil. He earned PhD in Management from Federal University of Rio de Janeiro, Brazil, Graduate Certificates in Logistics & Supply Chain Analysis and in Systems & Supportability Engineering from Stevens Institute of Technology, New Jersey, USA, and B.S. in Industrial Engineering from Estácio de Sá University, Brazil. He has taught courses about operations research, management and data science for graduate and undergraduate students. His research interests include demand planning, inventory management, supply chain, and multi-criteria decision making.

Rodrigo Luiz Gigante is master in Production Engineering from the University of São Paulo (2010); Bachelor of Applied Mathematics and Scientific Computing from the University of São Paulo (2007). He is a professor at Facens University. His areas of expertise are Operational Research, Discrete Event Simulation, Scheduling, Queue Theory, Production Planning and Control and Logistics.