LOGISTICS SYSTEM MODELING FOR A FERTILIZER COMPANY

ALEJANDRO FRANCISCO CARBÓ JASSIR

BARRANQUILLA

UNIVERSIDAD DEL NORTE

DIVISIÓN DE POSGRADOS E INVESTIGACIONES EN INGENIERÍA

MAESTRÍA EN INGENIERÍA INDUSTRIAL

2003

LOGISTICS SYSTEM MODELING FOR A FERTILIZER COMPANY

ALEJANDRO FRANCISCO CARBÓ JASSIR

Proyecto de Grado presentado como requisito parcial

para optar al título de Magister en Ingeniería Industrial,

área de énfasis en Gestión Industrial

Director: Grisselle Centeno, Ph.D.

Carlos D. Paternina Arboleda, Ph.D.

BARRANQUILLA

UNIVERSIDAD DEL NORTE

DIVISIÓN DE POSGRADOS E INVESTIGACIONES EN INGENIERÍA

MAESTRÍA EN INGENIERÍA INDUSTRIAL

2003

1 ABSTRACT

This study presents a computer model for the logistics system of a Fertilizer Company. The model, programmed using ARENA®, considers the physical installations and resources such as: transportation bands, ships, raw material bulk warehouses, packed finished product warehouses, tank-farms, roads, trucks and other logistics elements. The objective is to evaluate the existing material handling system, such that non-destructive assessment can be made and economical and feasible conclusions can be achieved.

The research methodology consisted on five basic steps. First, information from the company was gathered from historical data and interviews with the persons that work with the material handling system on a day to day basis. Second, the information was filtered and statistically organized so it could be inputted to the model. Third, an algorithm was constructed that is to act as the basis for the modeling construction. Fourth, the model was constructed based on the statistical data and the algorithm of the working system. This model was statistically validated and verified and then, replications of the model were carried out. The last step was to achieve conclusions based on the results from the simulated system.

The conclusions attained from the results of the simulation process are to be taken into account when the company prepares an investment plan for the material handling system that is currently working. The recommendations that are suggested from this investigation include the construction of a new warehouse for a specifically identified raw material, and the possibility of bringing into practice a new operation on the harbors when raw materials arrive.