



# The Master Production Schedule of Iranian Babak Copper Company

Heidar Yazdinejad  
Engineering department,  
Khatam University,  
Tehran, Iran.  
Heydar.yazdinejad@gmail.com

**Abstract—** Production scheduling involves the allocation and prioritization of optimally performing the manufacturing tasks. Clearly, minimizing the costs and increasing productivity matter the most to a production unit. Therefore, it appears necessary to adjust the activities in the program aimed at minimizing the costs and increasing productivity. Considering demand as a random variable brings the planning results closer to reality. Seeing the amount of demand as a random variable makes the problem highly complicated. In industry, copper pipes are used in different sizes and shapes (coils, pancakes, and branches), and each of these types of products has a very different manufacturing time, and thereby, different costs. We tried in this article to provide a one-month production schedule for the copper pipe factory of the Iranian Babak Copper Company by presenting a linear programming model with the objective function and the necessary constraints with the help of the Solver plugin in Excel software. Besides achieving the maximum profit, we expect the plan to meet the major needs of the market and operate compatibly with the capacity of the workstations. We also specified that which workstations should respectively add equipment to achieve a higher production capacity.

**Keywords:** Copper Pipe, Solver Plugin, Master Production Schedule

## I. INTRODUCTION

In the last two decades, the production planner and supply chain (SC) have introduced themselves as an outstanding research area [1]. Manufacturing industries have got into competition for higher market shares with the rapid moving of businesses toward globalization [2]. Production scheduling aims to employ limited resources in the manufacturing processes targeting the customers' demands to be met on the planning horizon. In other words, production planning issues

fall within a group of production issues to meet the market demand at the lowest cost or meet the market demand in such a way that maximizes the profits. Factories will surely face problems such as various interruptions in production, failure to forecast on required raw materials, the time required for production, the inability to decide on the composition of production, etc. without using scientific methods of production planning. Such problems confirm the need for proper production planning to properly use the existing capacities [3]. Some of the major problems and issues in Iran's manufacturing industries include the failure to properly allocate resources, the lack of proper production scheduling, and the failure to optimally use machinery capacity. This situation can be largely seen due to the traditional system and traditional ideas in the industrial factories of this country. Thus, successful industry leaders have to find scientific solutions to resolve the problems of their companies and industries aimed at eliminating such problems. In this regard, and based on the conducted research, the use of various sciences, including mathematics, operations research, and statistics can significantly contribute to improving the production situation of companies.

The science of operations research is finding the best solution to management problems and operations research is the science of quantitative management and is based on quantitative factors, which is one of the reasons for this science. One of the most widely used topics of operations research is to reduce production times and costs. The topics of production line modeling and production scheduling of products are among the existing and important topics in operations research science, which play a major role in reducing production times and timely delivery of products to customers. Linear programming [4] is a mathematical technique that is extensively used in management planning. This application is subject to the existence of a certain