

# **Cycle Time Optimization of a Multi-Product Production Line in a Multiple Objective Setting**

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*Received August 2006; Revised May 2007; Accepted November 2007*

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**Abstract**—Multi-objective optimization techniques have made inroad into various aspects of managerial decision making process such as investment, environmental analysis of major projects, etc. The field of operations management, in particular production management, has been somewhat behind in utilizing such techniques. In this paper, we consider a production line that produces several predetermined batches of products. Bi-objective optimization as a form of multi-objective optimization has been utilized in this paper. The aim is the optimization of two conflicting objectives by minimizing simultaneously the cycle time and the buffer sizes of the production line. We utilize the concept of satisfaction function for the purpose of aggregating these two incommensurable objectives. Numerical examples are presented to demonstrate the application of the model and the steps involved in the modeling of the problem.

**Keywords**—Production line, Capacity, Buffer size, Compromise programming, Satisfaction function

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