

## Multi-Stage Multi-Period Production Planning in Wire and Cable Industry

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**Abstract :** This paper presents a methodology for serial production planning problem in wire and cable manufacturing process that addresses the problem of input-output imbalance in different consecutive stations, hoping to minimize the halt of machines in each stage. To this end, a linear Goal Programming (GP) model is developed, in which four main categories of constraints as per the number of runs per machine, machines' sequences, acceptable inventories of machines at the end of each period, and the necessity of fulfillment of the customers' orders are considered. The model is formulated based upon on the real data obtained from IKO TAK Company, an important supplier of wire and cable for oil and gas and automotive industries in Iran. By solving the model in GAMS software the optimal number of runs, end-of-period inventories, and the possible minimum idle time for each machine are calculated. The application of the numerical results in the target company has shown the efficiency of the proposed model and the solution in decreasing the lead time of the end product delivery to the customers by 20%. Accordingly, the developed model could be easily applied in wire and cable companies for the aim of optimal production planning to reduce the halt of machines in manufacturing stages.

**Keywords :** goal programming approach, GP, production planning, serial manufacturing process, wire and cable industry

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