ABSTRACT

The development of the manufacturing industry in Indonesia has a significant increase. The tight competition requires companies to further improve their performance so they can survive and compete with competitors. PT. XYZ must adjust production capacity in order to provide optimum production levels. The problem that occurs is that the production target set by the company cannot be achieved properly, with an average level not reached by 45%. This is caused by the low efficiency of the production line, where is a time difference in each workstation that causes a bottleneck because some workstations carry out a full process and some other workstations are idle because they are waiting for input from the previous workstation. This research was conducted to assist companies in solving these problems using assembly line balancing. Assembly line balancing is a method for balancing the allocation of work elements on each workstation to minimize the total idle time for all workstation at a specified level of output. The purpose of balancing the assembly line is to minimize idle time on each workstation so that, high efficiency is achieved at each workstation. In this research, the method used that is genetic algorithm and the results show the significant change from the balance delay results in the proposed assembly line decreased to 20.59% from the actual assembly line 82.35%, line efficiency on the proposed assembly line increased to 76.90% from the actual assembly line 17.65%, and smoothing the index on the proposed assembly line decreased to 3.42 from the actual assembly line 66.21.

Keywords: Assembly Line Balancing, Genetic Algorithm, Balance Delay, Line Efficiency, Smoothing Index.