

ABSTRACT

A strict competition in the manufacturing industry causing each company compete to maintain their position in the global market. To be able to compete in the global market, each company required to be more creative in increasing the quality of their product. PT. Dirgantara Indonesia (PTDI) is an aerospace company that established in 1976 as a state-owned company that located in Bandung which primary business line is producing an airplane and helicopters. Production process of airplane and helicopters is starting from making a part in detail part manufacturing department, after that, those part is assembled in component assembly department to make a component like fuselage, tail, door, and wings, after that those component is assembled to make an airplane or helicopter in final assembly line department. Based on the actual condition, the company has not been able to meet the production target of fuselage component assembly that is 6 unit component in a year because of the unbalance allocation between operator and workstation that causing an idle time. Idle time is a condition where several station is fully working whereas another several station is waiting an input from the previous station. This study is aimed to help the company to solving these problem, by doing rebalancing of workload between operator in each workstation, so that could minimize the idle time. This study, is using Multi-manned Assembly Line Balancing (MmALBP) model with Mixed Integer Programming method to solving assembly line balancing problem by applying two mathematical models. The 1st mathematical model aims to minimize the cycle time of an assembly line, and the 2nd mathematical model aims to determine the optimal number of operators and minimizing gap of time from allocation operation between operators. Result from this problem can decreasing the value of idle time from 905.22 hours in actual line to 499.49 in proposed line, also increasing the efficiency on assembly line which in actual condition 54% to 67%, the balance delay is decreases to 33% from 46%, also smoothness index is decreasing from 337.94 to 204.51 in the propose assembly line.

Keywords : *Assembly Line Balancing, Multi-Manned Assembly Line Balancing, Mixed Integer Programming*