ABSTRACT

This study discuss the analysis of makespan value comparison on D-Nose Airbus A-320 production process in Flexible Manufacturing System (FMS) environment at PT. Dirgantara Indonesia. Makespan is the total time needed to produce the product based on the job sequences from its fragment. In this study, the production sequences are redesigned using the Discrete Dynamic Programming – Genetic Algorithm (DDP – GA) approach, the process will be iteratively performed until the objective function to minimize the Airbus A-320 D-Nose's production makes pane is fulfilled.

From this study, the Discrete Dynamic Programming and Genetic Algorithm shown to be capable to improve the processing time efficiency on D-Nose production. Decreases on make span means the operator and machine work load will be reduced, so it can be assigned to other program. From the optimization, the improvement was up to 36,895 % from its current make span. The reduced make span were approximately 229,25 hours. This result was obtained from 5 experiment attempts, where the current state (first make span) was 621.35 hours.

When designing the improvement analysis, the optimization should be take place mainly in redesigning the production sequences by using the DDP approach. This optimization objective is to get the best production sequences available from several alternatives. The next step was performed by using the Genetic Algorithm approach. The process started by generating 70 individuals randomly, which later be scattered into 10 parallel lines evenly and be optimized. This process will iteratively take place until the maximum value of generations is reached, which is a 100 generations. The output from the experiment is a solution with a maximum fitness value, which will be the basic in redesigning the production schedule of Airbus A-320 D-Nose. Improvement analysis then performed by comparing the performance percentage of current production schedule to optimized production schedule.

Keywords: Flexible Manufacturing System (FMS), Discrete Dynamic Programming (DDP), Genetic Algorithm, scheduling, Make span, job sequences.