ABSTRACT

The main purpose of this research is to find the sequence to process the job on each machine used to find minimum makespan using Genetic Algorithm Approach that has been adapted with the condition of the production process in PT PINDAD (Persero) on *Kapal Navigasi DM.30/MI/08/011* product. The data been used on this research are, component that are going to be produced, component routing, processing time of job on each machine, set up time of job on each machine, total type of machines been used with total unit of each type of machine, and total unit of job that want to be produced.

The beginning of searching the solution space is generating all of the feasible solution as many as the population size has been inputed. After that, evaluate with decoding each individu. There are 2 decoding procedure proposed in this research, which are stand still and first available. The next step, calculate each individu fitness value. Then do the Genetic Algorithm operatinm that are mutation and cross over. The step above are repeated until satisfy the stopping rule. Stopping rule used in this research is maximum generation demanded.

Output from Genetic Algorithm is the job sequence operation on each machine that satisfy the criteria, which is minimum makespan. Genetic Algorithm work randomly, so that each decoding procedure is repeated five times. Genetic Algorithm produced makespan with value 166,5 hour, while the exixting schedule produced makespan with value 288,5 hour. This Algorithm can eliminate 42,22% makespan value.

Keyword : Scheduling, Job Shop Scheduling, Genetic Algorithm