ABSTRACT

PT EFG was founded in 1968, which one of the pharmaceutical companies in Indonesia, which is engaged in the production of medicines. The number of types of drugs produced is directly proportional to the number of machines operated at PT EFG. One machine which is often failure is the filling ampoule XYZ machine with a frequency of failure 19 times with a span of time from 2017 to 2018. With high frequency of failure, this has an impact on the reliability and total cost required to carry out maintenance of machine. So far, maintenance scheduling of machine has only been done once in two months with total failure of 19 times and the total cost incurred is Rp. 711,855,393.84. So, another alternative is needed by using optimization techniques. The steps which can be taken to optimize the scheduling of filling ampoule XYZ machine by using simulated annealing method formulated through three fitness function equations which consist of fitness function 1, fitness function 2, and fitness function 3 with each different parameter requirement. Fitness 1 produced fitness value with reliability = 98.99% and total cost = Rp. 334,404,698.40. Then, in fitness 2 produced fitness value with reliability = 98.90% and total cost = Rp 157,061,887,10. The last, fitness 3 produced fitness value with reliability = 99.35% and total cost = Rp. 279,949,855.70. Based on the results of the scheduling research 3 the proposed fitness functions have total cost which is smaller than the previous total cost of the schedule, thus the proposed schedule is better than the previous schedule.

Keywords: *Filling Ampoule Machine, Simulated Annealing, Fitness Function, Reliability, Total Cost.*