ABSTRACT

PT.Pos Logistik Indonesia is a 3PL company that optimizing the PT.Pos Indonesia networks in Indonesia. The pickup-and-delivery problem (PDP) process at PT.Pos Logistik Indonesia uses heterogeneous KBM, time windows based on shift, and fluctuating cargo demand. Based on observations and interviews, the author found a problem, that the utility of KBM is not optimal on secondary routes. Based on the average of PT. Pos Logistik utility target on the secondary route is 40%, while the average percentage of KBM capacity utility for outgoing is 18.702% and incoming is 18.704%. Departing from these problems, PT.Pos Logistik Indonesia requires route design that can increase the utility of each vehicle by visiting more than one route which will be in line with the aim of minimizing operational costs. The proposed solution is to design a route using the multi start adaptive large neighborhood search (MSALNS) algorithm, which is based on two phases, namely: phase I, grouping routes based on distance using the nearest neighbors algorithm and phase II using the adaptive large neighborhood search (ALNS) algorithm as the final solution with a heuristic removal and insertion procedure. By reassigning the KBM on existing route on 22-28 December 2019 compared with the solution, the KBM utility increases by 20% to 30%.

Keywords: Vehicle Routing Problem(VRP), Pickup and Delivery Problem (PDP), Heterogeneous, Time Window, Multi Start Adaptive Large Neighborhood Search (MSALNS)