

## ABSTRAK

### **PENENTUAN RUTE TERBAIK PENDISTRIBUSIAN GAS INDUSTRI MENGUNAKAN ALGORITMA *ANT COLONY OPTIMIZATION* (Studi Kasus di PT. Samator Gas Industri, Kudus)**

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**Abstrak** – Penentuan rute terbaik pendistribusian dapat dilakukan untuk meningkatkan *performance* dalam proses distribusi. Utilisasi truk di PT Samator Gas Industri saat ini masih rendah yaitu 61,24% dari kapasitas maksimum truk 7000 kg. Penelitian ini bertujuan untuk menentukan rute terbaik pendistribusian gas industri di PT Samator Gas Industri untuk meminimasi jarak tempuh kendaraan dan penghematan biaya bahan bakar serta memaksimalkan utilisasi truk dengan batasan *Capacitated Vehicle Routing Problem with Pickup and Delivery for Multiple Products* dengan *Dynamic Demand* yang diselesaikan dengan metode pendekatan algoritma *Ant Colony Optimization* (ACO). Penelitian ini mempertimbangkan 2 jenis layanan pendistribusian yaitu *pickup and delivery* dengan batasan kapasitas kendaraan yang homogen. Penelitian ini menggunakan menggunakan 2 kelompok relasi meningkatkan utilisasi truk sebesar 91,86%, menurunkan persentase total jarak tempuh sebesar 15,589% menjadi 398.12 km perhari dari yang sebelumnya 324.11 km perhari, dan penghematan kebutuhan biaya bahan bakar sebesar 15,589%.

**Kata kunci** – CVRP, VRPPD, VRPMP, *Dynamic Demand*, ACO, Distribusi Gas Industri

## **ABSTRACT**

### ***DETERMINING THE BEST ROUTES OF INDUSTRIAL GAS DISTRIBUTION USING ANT COLONY OPTIMIZATION ALGORITHM (Case Study in PT. Samator Gas Industri, Kudus)***

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**Abstract** – Determination of the best route of distribution can be done to improve performance in the distribution process. Truck utilization at PT Samator Gas Industri is currently still low at 61.24% of the maximum truck capacity of 7000 kg. This study aims to determine the best route for distribution of industrial gas at PT Samator Gas Industri to minimize vehicle mileage and fuel cost savings as well as maximize truck utilization within the limits of Capacitated Vehicle Routing Problem with Pickup and Delivery for Multiple Products with Dynamic Demand which is solved by the approach method. Ant Colony Optimization (ACO) algorithm. This study considers 2 types of distribution services, namely pickup and delivery with a homogeneous vehicle capacity limit. This study uses 2 groups of relations to increase truck utilization by 91.86%, reduce the percentage of total mileage by 15.589% to 398.12 km per day from the previous 324.11 km per day, and save fuel costs by 15.589%.

**Keywords** – CVRP, VRPPD, VRPMP, Dynamic Demand, ACO, Industrial Gas Distribution