

ANALYSIS OF GENSET CAPACITY PLANNING AS BACK UP ELECTRIC ENERGY IN KOST VIA WIJAYA 1

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ABSTRACT

Yogyakarta is known as a student city because almost 20% of the population in Jogja are students, and the number of campuses in Jogja is estimated to reach more than 60 campuses, almost all of which are accredited. As a result of the large number of students studying in Yogyakarta, most students rent accommodation/boarding houses. Boarding houses certainly require electrical energy as the main source to run electrical equipment. In general, the use of electrical energy in boarding houses uses electrical energy from the State Electricity Company (PLN), but the electrical energy supply from PLN is not able to continuously provide electrical energy without interruption. So, to anticipate disruptions, it is necessary to have an energy back-up system in the form of a Generator Set (Genset) so that electrical energy for boarding house needs is maintained. The generator capacity used for back-up electrical energy is 1 unit with a capacity of 2.9 kVA. It can be said that the existing power capacity is suitable and can back up the electrical power needs at the Via Wijaya 1 boarding house in the event of a power outage from PLN. The CB safety rating used in the outgoing generator to the busbar after calculations produces a value of 6.5 A, which is available on the market is 10 A, so the CB used is 10 A. The conductor chosen for the outgoing generator with a KHA calculation result of 6.8 A and if you refer to the NYA table in the PUIL guidelines, this value is not there, so it is assumed to be 7 A, with 7 A the cross-sectional area of the cable used is 0.75 mm². From the simulation results of ETAP (Electric Transient Analysis Program) 12.6 single line diagram with running unbalance load flow analysis on 2 mechanisms, the generator supply condition experienced a voltage drop at meter 1 of 15.51 V, at meter 2 of 15.56 V, and at meter 3 was 15.67 V. When the generator supply condition experienced a decrease in current at meter 1 of 0.2 A, at meter 2 it was 0.2 A, but at meter 3 there was no decrease in current. After adding the capacitor bank, the voltage and current can be said to be normal without experiencing a decrease in voltage and current. After adding capacitors, the bank has complied with the electricity distribution regulations set by the Minister of Energy and Mineral Resources.

Keywords: *PLN, Generator Set, Electrical Energy, ETAP, Capacitor Bank*