ABSTRAK

ESTIMASI HOSTING KAPASITAS PV PADA PENYULANG BAWAL DI GARDU INDUK METRO

Oleh:

I Wayan Rangga Krisnata

Pemanfaatan PV(*Photovoltaic*) pada jaringan distribusi memerlukan analisis kapasitas hosting agar integrasi tidak menimbulkan masalah operasi. Penelitian ini bertujuan mengestimasi kapasitas hosting maksimum PV pada Penyulang Bawal di Gardu Induk Metro dengan memperhatikan batasan *overvoltage*, *overloading* saluran (line *overloading*) dan transformator (*transformer overloading*), serta *reverse power*. Pemodelan sistem dilakukan menggunakan Matpower dengan metode aliran daya *Newton-Raphson*. Hasil simulasi menunjukkan bahwa injeksi daya aktif PV mampu meningkatkan profil tegangan bus yang sebelumnya mengalami *undervoltage* serta menurunkan rugi-rugi daya. Kapasitas hosting bervariasi di setiap bus, dengan sebagian besar dapat menampung hingga 4,5 – 4,7 MW, sementara beberapa bus dibatasi oleh tegangan dan kapasitas transformator. Kesimpulannya, penentuan lokasi dan kapasitas PV sangat berpengaruh terhadap keandalan sistem distribusi, sehingga evaluasi teknis perlu dilakukan sebelum integrasi.

Kata kunci: kapasitas hosting, PV, Sistem distribusi, aliran daya.

ABSTRACT

ESTIMATION OF PV HOSTING CAPACITY ON BAWAL FEEDER AT METRO SUBSTATION

By:

I Wayan Rangga Krisnata

The utilization of PV in distribution networks requires a hosting capacity analysis to ensure that integration does not cause technical issues. This study aims to estimate the maximum PV hosting capacity on the Bawal Feeder at Metro Substation by considering overvoltage, line and transformer overloading, as well as reverse power. The system modeling was carried out using Matpower with the Newton-Raphson power flow method. The simulation results indicate that active power injection from PV can improve the voltage profile of buses previously experiencing undervoltage and reduce power losses. Hosting capacity varies across buses, with most capable of accommodating up to 4.5–4.7 MW, while some are constrained by voltage limits and transformer capacity. In conclusion, the location and capacity of PV significantly influence the reliability of the distribution system; therefore, technical evaluations must be conducted prior to integration**.**

Keywords: hosting capacity, PV, distribution system, power flow.