ABSTRACT

The increasing installation of photovoltaic (PV) systems in distribution networks poses challenges to maintaining network stability. PV and inverters are usually installed in solar electricity production, currently production can be found in homes, office buildings and also power plants. Its use and development has now reached significant development, because basically it only requires sunlight as an energy source. Good utilization of both can be used optimally to achieve optimal reactive power as well. Power is the power that appears due to passive components outside the resistor which is power losses or unwanted power. The challenge of utilizing the available power is to fulfill the need for optimal reactive power in the electric power system.

In distribution networks, PV system integration causes reverse power flow which creates an increase in grid voltage. In the case of PV power being higher than the load, the reverse active power flow causes the network voltage to rise. Reverse flow also affects the power factor on each bus connected to each load. To keep the voltage and power factor within limits and maximize the active power of the PV system, an overvoltage control (OVC) design will be demonstrated from ETAP.

In this final task the controller uses the voltage from the PV system to maintain stability and power factor at a specified level without exceeding the PV capacity and reactive power limits. Two ETAP OVC control simulations were created to analyze the electricity network in order to avoid overvoltage problems. OVC by placing a voltage controller by an inverter and placing a voltage on the load has a difference of 143 kVar.

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Keywords:*inverter, photovoltaic, overvoltage control,reactive power.*