Dear Reviewer:

Thank you for taking the time to consider our work, “Optimal Voltage Phasor Regulation for Switching Actions in Unbalanced Distribution Systems”, for publication. This paper is an in-depth examination of a new approach for optimization of the use of Distributed Energy Resources (DER) in distribution systems. In our approach we propose a novel linearization of the unbalanced power flow equations that explicitly models voltage phase angles. Using this new linear model, we then formulate an Optimal Power Flow problem designed to control DER to minimize voltage phasor difference across an open switch while simultaneously regulating feeder voltage magnitudes within acceptable limits. Simulation results on modified versions of the IEEE 13 node test feeder confirm the ability of the OPF to track voltage phasor targets and drive voltage magnitudes into desired ranges.

To our knowledge, this work is the first to consider an extension of the *DistFlow* power flow equations for unbalanced systems where voltage phase angles and magnitudes are jointly modeled. Additionally, we believe this work to be the first that considers both voltage magnitudes and phase angles in an OPF formulation. Although the formulated OPF is based on a linearized model of power flow (as opposed to an exact convex relaxation of the problem), it allows problems to be solved which either cannot be formulated as semidefinite programs or for which it is difficult to obtain a tight relaxation.

As we discuss in the paper, the ability to control the entire voltage phasor, we feel, can facilitate switching of components into and out of distribution systems with minimal disturbance to feeder voltages. As a result of this, it now becomes possible to quickly reconfigure distribution systems and microgrids without concern for large instantaneous power flows as a result of switching actions. As we discuss in the conclusions, the availability of a linearized three phase power flow model in OPF formulations has the potential to allow a diverse set of problems to be addressed including decisions involving mixed-integer variables and stochastic representations of inputs. Thank you again for considering this research for publication in *IEEE* *Transactions on Smart Grid.*

Sincerely,

The Authors