

Abstract

The amount of energy harnessed from Renewable energy sources (RES) is constantly increasing. This rise can be attributed to technological advancement that has lowered generation costs, financing from governments and private sector, efficient payment plans (e.g. Pay As You Go), and need for clean energy. RES are either integrated into the local distribution grids or used as standalone/off grid solutions that facilitate easy energy access to meet the ever-increasing power requirements. Extensive studies on the behavior of power networks integrated with RES is therefore required so as to facilitate the changes that will be made on the current grid configuration. This study assessed the impact on the harmonics and flicker of distributed networks due to the integration of wind and solar energy sources. To achieve this, the IEEE-33 bus system was integrated with RES at selected locations and power quality and harmonic analysis performed using DigSILENT PowerFactory software. Results obtained indicate increased harmonic and flicker levels of distribution networks. The levels of harmonic distortion and flicker obtained were found to be reliant on the type, penetration level and installation patterns of RES.