

DC-Link Protection for Grid-Connected Photovoltaic System: A Review

Wan Nur Huda Aqilah Alias 1 and Muhamad Zahim Sujod 2

1 Universiti Malaysia Pahang, 26600 Pekan, Pahang, Malaysia
wannurhudaagilahalias@gmail.com

Abstract:

As the economic growth and population increase, the demand on energy supply has also increases. The disadvantages that energy production based on non-renewable energy sources bring to the environment has stimulate the idea of producing a clean and sustainable power in huge quantities from renewable energy sources such as solar and wind energy. In recent years, photovoltaic (PV) systems are mostly used due to its light and easy-installable characteristics. It has two approaches which are stand-alone PV system (off-grid) and grid-connected PV system. Although it is said to be the most promising renewable energy, it could not avoid from disturbance. In grid-connected PV system, faults could occur on the grid side, leading to the increase in DC-link voltage and overshoot grid current. These situations could stress electrical components and decrease power quality of the system. Therefore, many protection schemes have been introduced to overcome this matter. In this paper, the development of grid-connected PV system was expressed and the impacts of grid faults on were discussed. Several conventional protection schemes implemented in the grid-connected PV system were reviewed. In the end, this paper proposed a new protection scheme which namely zero protection scheme that has the same function to limit the overshoot in DC-link voltage.

Keywords : DC-Link Protection; PV System; DC-Link Overvoltage.

Acknowledgments

This research is supported by Universiti Malaysia Pahang (UMP) Research Grant Scheme (RDU 1803165). The authors would like to thank the Faculty of Electrical and Electronics Engineering, providing the facilities to conduct this research.