



ISLANDING DETECTION TECHNIQUE BASED ON VECTOR SHIFT

This project is presented in partial fulfillment for the award of the

Bachelor of Engineering (Hons.) Electrical

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JULY 2013

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ACKNOWLEDGEMENT

Alhamdulillah, with the greatest gratitude to Allah The Almighty for His gracious blessing and guidance throughout the whole period taken by me to successfully complete this project by send many people into my life which willing to help me whenever I had problem. Without His permission, it is impossible to make anything happen and become true.

I would like to take this opportunity to sincerely express my highest appreciation to my project supervisor, Dr Hasmainsi binti Mohamad for her valuable guidance, teachings, suggestions, advices and support throughout this project. Thank you for bearing with my incompetence and patiently guide me to the end of this project.

Furthermore, my deepest gratitude to my family and to all those who have helped making this journey worthwhile with all the support and encourage. I would also want to thank my entire friends that contribute in this project.

Finally, I would like to thank all those who have contributed information, knowledge, ideas, time and effort directly and indirectly in the progression of this final year project. Honestly, I am very grateful for all their favors and support, and I will remember it throughout my life. Thank you so much again and may Allah S.W.T bless them.

Thank You.

ABSTRACT

Islanding refers to the condition in which a distributed generator (DG) continues to power a location even though electrical power from the electric utility is no longer present. Islanding can be hazardous to the DG, and should be prohibited. Thus, a reliable and fast detection technique is needed to detect islanding and isolate the DG from the main grid. In this paper, islanding detection technique based on Vector shift (VS) method is presented. This method detects islanding when voltage phase is shifted beyond the threshold limit/setting. A new component known as Vector Shift Detector (VSD) was modeled by using PSCAD simulation tools to detect the changes of phase angle at DG's terminal voltage. A simulation studies on a distribution network with mini hydro generation was carried out to evaluate the VSD model. To evaluate the effectiveness of VSD, it has been tested under various case studies which are loss of mains and different types of faults. The result showed that the VSD was able to distinguish disturbances event would lead to islanding.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This research enclosed the study and analysis of islanding detection techniques. Islanding is a situation in which a distribution system becomes electrically isolated from the main power supply, due to fault upstream or any other disturbances and yet continues to be energized by the DG connected to it. Reliability of power supply can be improved when performing islanding. However due to safety concern and risk that associated with the unplanned islanded system, current regulation has required immediately disconnect the DG units once the DG become electrically isolated from the main utility supply.

An islanding detection technique is critically required to detect any abnormality in the grid that can result in islanding. The DG should be disconnected from the grid following any detection of islanding events. This detection technique must be fast, reliable and should be capable of operating in a timely manner to avoid damages that could result from reclosing on an energized network.