



The Fourth Annual Research Symposium (ARS-2017)
Faculty of Engineering, University of Ruhuna, Hapugala, Galle.



ARS 2017/E/08

Mitigating Frequency Fluctuations in Micro-Grids Using Energy Storage Systems

Ariyaratne R. M. A. S. , Kumari M. G. S. I., Fernando B. D. S. K and
Chandrasena R. P. S.

*Department of Electrical and Information Engineering, Faculty of Engineering,
University of Ruhuna*

** Corresponding Author: chandrasena@eie.ruh.ac.lk*

Micro-grids are becoming increasingly attractive to consumers as well as to power utilities. A great number of them will be installed at consumer sites. In this situation, reliability of micro-grid operation is more important. However, micro-grids are equipped with distributed energy resources with low inertia constants and their primary energy sources are intermittent in nature. Hence, islanded micro-grids are vulnerable for frequency fluctuations and it can cause serious instability issues. Hence desirable frequency regulating method is vital for the effective operation of micro grids. Hence, this paper investigates the effectiveness of using the battery energy storage for mitigating frequency fluctuations in micro-grids. A microgrid with renewable solar power plant is modelled in MATLAB simulink along with the proposed battery energy storage with its control. Simulation results confirm that the frequency fluctuation in the system can be minimized with the help of the proposed battery energy storage.

Keywords: microgrids, frequency fluctuations, battery energy storage