# Fuzzy Logic Based UPFC and Laboratory Prototype Validation for Dynamic Power Flow Control in Transmission Lines

Norilhamiah, Y., Kamaruddin, S.K., Karim, N.A., Masdar, M.S., Loh, K.S.

## Abstract

In this paper, Fuzzy Logic Controller (FLC) is proposed to overcome the problems of the existing UPFC controllers and to provide the dynamic power flow control through transmission lines. Although many researches have been focusing on developing UPFC control strategies for power flow control through simulation, there is a lack of experimental validation of different UPFC controllers and its performance in real time operation. In order to investigate the performance of the proposed FLC based UPFC, a laboratory prototype has been developed using two 6-pulse converters. The shunt and series controller for both PI and FLC based UPFC prototype are designed in MATLAB/SIMULINK® using Speedgoat® performance real time target machine. The UPFC prototype is tested on $6-$bus power system network model to verify its capability. The results revealed that the UPFC prototype had successfully controlled power flow dynamically in transmission line with enhanced accuracy. In addition, other power system parameters have been improved significantly.