Fuzzy Logic PSS with Voltage Controlled Supplementary Signal For Enhancing Power System Stability

Assoc. Prof. A. A. Ishak    Eng. M. S. Helaal
Electrical Engineering Department, Zagazig University, Benha branch ,
Faculty of Engineering (Shoubra), Cairo, Egypt.

Abstract

A novel fuzzy logic based power system stabilizer with supplementary signal controlled from a signal proportional to the generator terminal voltage is presented, for the purpose of enhancing the stability margin of power systems. The suggested stabilizer is termed voltage-controlled fuzzy logic power system stabilizer (VCFLPSS). The tuning of the VCFLPSS parameters is based on the prior solution of the system model based on eigenvalues technique. The performance of the suggested controller is studied through computer simulation when applied to both a single machine connected to an infinite system and to the generators of a multimachine power system under both small perturbation and large scale disturbance. A comparative study between the conventional (CPSS), the fuzzy logic stabilizer (FLPSS), and the suggested controller (VCFLPSS) is presented to establish the effectiveness of the latter in damping out power system oscillations as well as in enhancing the power system stability limit.

Keywords: power system stabilizer, multimachine, damping enhancement, fuzzy logic control