Design Of PSS And STATCOM-Based Damping Stabilizers Using Genetic Algorithms

Abido, M.A.; Dept. of Electr. Eng., King Fahd Univ. of Pet. & Miner., Dhahran, Saudi Arabia;

Power Engineering Society General Meeting, 2006. IEEE;Publication Date: 18-22 June 2006; ISBN: 1-4244-0493-2

Summary

Power system stability enhancement via coordinated design of power system stabilizers (PSSs) and STATCOM-based damping stabilizers is thoroughly investigated in this paper. This study presents a singular value decomposition (SVD) based approach to assess and measure the controllability of the poorly damped electromechanical modes by different control inputs. The coordination among the proposed damping stabilizers and the STATCOM internal AC and DC voltage controllers has been taken into consideration. The design problem of STATCOM-based stabilizers is formulated as an optimization problem. Then, a real-coded genetic algorithm (RCGA) is employed to search for optimal stabilizer parameters. The nonlinear simulation results show the effectiveness and robustness of the proposed control schemes over a wide range of loading conditions.