

عنوان مقاله:

A Multi-Objective HBMO-Based New FC-MCR Compensator for Damping of Power System Oscillations

محل انتشار:

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خلاصه مقاله:

In this paper, a novel compensator based on Magnetically Controlled Reactor with Fixed Capacitor banks (FC-MCR) is introduced and then power system stability in presence of this compensator is studied using an intelligent control method. The problem of robust FC-MCR-based damping controller design is formulated as a multi-objective optimization problem. The multi-objective problem is concocted to optimize a composite set of two eigenvalue-based objective functions comprising the desired damping factor, and the desired damping ratio of the lightly damped and undamped electromechanical modes. The controller is automatically tuned by optimization of an eigenvalue-based multi-objective function using Honey Bee Mating Optimization (HBMO) to simultaneously shift the lightly damped and undamped electromechanical modes to a prescribed zone in the s-plane so that the relative stability is guaranteed and the time domain specifications concurrently secured. The effectiveness of the proposed controller in damping low frequency oscillations under different operating conditions is demonstrated through eigenvalue analysis and nonlinear time simulation studies. The results show that the tuned HBMO-based FC-MCR controller which is designed by using the proposed multi-objective function has an outstanding capability in damping power system low frequency .oscillations and significantly improves the power systems dynamic stability

کلمات کلیدی:

Magnetically Controlled Reactor with Fixed Capacitor Banks, Power System Dynamic Stability, Honey Bee Mating Optimization, Multi-objective optimization

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