

عنوان مقاله:

Design of UPFC-PSS Using Firefly Algorithm for Stability Improvement of Multi Machine System under Contingency

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خلاصه مقاله:

The multi machine power system, with the interconnection of number of generators and loads, has the dynamic stability as the important factor for maintaining the step with respect to the generators connected to it. The stability of individual machine, as well as, the stability of a generator with the other generators are more important terms. The supply of the damping torque required for getting the desired condition of stability enhancement is done by the power system stabilizer. In this paper a new method is proposed for stability enhancement of a three machine nine bus system by using the coordinated application of the unified power flow controller and the power system stabilizer designed by using the Firefly algorithm. The improved stability performance of the tested multi machine system was compared with Genetic search algorithm approach without and with the application of the unified power flow controller. From the pseudo spectrum analysis, it is observed that the better improvement of the stability of the multi machine system is achieved by using the proposed method. From the step responses it can be deduced that the relative variations of inter machine states with unified power flow controller and firefly-based power system stabilizer are settled at a faster rate. The contingency analysis is performed to consider the non-linearity problem. The responses of the system with unified power flow controller and firefly based power system stabilizer are settled at a faster rate in the normal case, as well as, in the contingency cases, respectively.

کلمات کلیدی:

Power system stabilizer (PSS), Firefly Algorithm (FFY), Genetic Algorithm (GA), Unified Power Flow Controller (UPFC), Pseudo Spectrum Analysis, Contingency

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