Abstract

In this paper the design of Proportional Integral (PI) controller is proposed using Craziness Particle Swarm Optimization (CPSO) based Integral Square Error (CPSOISE), CPSO based Apex Stability Verge (CPSOASV) and Multi-Objective based CPSO (MOCPSO) are used to design the controller for a two-area power system considering Governor Dead Band (GDB) and Generation Rate Constraint (GRC) nonlinearities coordinate with Super Conducting Magnetic Energy Storage (SMES) units and interconnected through Thyristor Controlled Phase Shifter (TCPS). CPSO algorithm is a powerful optimum search technique, the salient advantage is that it is highly insensitivity to large load changes and disturbances in the presence of plant parameter variations and system nonlinearities under load following variations. For the proposed method, two types of controllers namely, Mutual Aid Criterion (MAC) based Integral Square Error (ISE) and Apex Stability Verge (ASV) controllers are designed first and then the proposed MOCPSO controller is designed. Simulation results of the proposed MOCPSO controller is not only effective in damping out frequency oscillations, but also capable of alleviating the transient frequency swing caused by the disturbances. From the dynamic responses it reveals that the MOCPSO based controller for the two area reheat power system with SMES, interconnected with TCPS ensures better transient performance and faster settling time than that of the CPSOISE based controller.
References

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Index Terms

Computer Science
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Keywords
Apex Stability Verge (ASV) Craziness Particle Swarm Optimization based Apex Stability
(CPSOASV) CPSO based Integral Square Error
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(MOCPSO).