

عنوان مقاله:

Power Management Optimization In Wind-Diesel Hybrid System Based on Imperialist Competitive Algorithm

محل انتشار:

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نویسندگان:

Hossein MaroufiDeilami - *Science and Research Branch of Islamic Azad University of Khouzestan,Ahvaz,Khouzestan,Iran*

Bijan Roshanravan - *Shahid ChamranUniversity of Ahvaz, Khouzestan , Iran*

Mohsen Yunesi - *Science and Research Branch of Islamic Azad University of Khouzestan,Ahvaz,Khouzestan,Iran*

SaeedAllah Mortazavi4 - *Shahid ChamranUniversity of Ahvaz, Khouzestan , Iran*

خلاصه مقاله:

This paper proposes a robust control of frequency variation in an isolated Wind-Diesel Hybrid System(WDHS) using Battery Based Energy Storage System(BESS), Automatic Voltage Regulator(AVR) and Dump Load(DL). The structure of the frequency controllers of the BESS and the AVR are proportional Integral(PI) controllers and for the DL is an Proportional derivative(PD) controller with single input. The performance of the WDHS is tested through simulation. Simulation graphs for frequency and active power of the isolated power system. Active power generated/absorbed by the different elements for the positive load steps. Positive load steps increases the load consumed power to a level more than the Wind Turbine Generator(WTG) produced power, so that to balance active power a positive Diesel Engine(DG) is needed. As the speed governor cannot control frequency in the DG instantaneously, the PI controllers orders BESS to feed the load until the DG would be able to control the situation. On the other hand, as the produced power rises more than the consumed load, the PD controller orders DL to absorb the additional active power. Imperialist Competitive Algorithm (ICA) is applied to solve an optimization problem and to achieve PI's and a PD controllers coefficients associated with BESS, AVR and DL simultaneously

کلمات کلیدی:

wind diesel, hybrid system, Battery based energy storage system, Dump load, Diesel generator

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