

عنوان مقاله:

Optimal Load Frequency Control of an Island Small Hydropower Plant

محل انتشار:

سومین کنفرانس ملی صنعت نیروگاههای حرارتی (سال: 1390)

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خلاصه مقاله:

In general, The Frequency is a vital characteristic of the network and allowed frequency deviation restricted to a few percents of one Hertz. The frequency of an isolated small hydropower plant is controlled using a dump load and on/off valve control. The water flowing through the penstock is redirected in smaller pipes, three fixed with motor operated valves while opening and closing of the valves is attained by on/off controls. On/off control is utilized in order to reduce the size of dump load because the dump load is a high cost apparatus. However, disadvantage of this method is a large deviation in the frequency of the hydro-generation units. In this paper, a PI controller has been used to reduce the peak of frequency deviation. The optimal gain of PI controller and integrator of dump load is obtained by genetic algorithm (GA) to achieve minimum frequency deviation. In this method, the peak of frequency deviation is reduced less than one Hz while in the conventional scheme, the peak of frequency deviation is three Hz. In other words, the positive or negative peak of frequency deviation has been reduced about 60%.

کلمات کلیدی:

Small Hydropower Plants, Load Frequency Control, Optimal Controller, Genetic Algorithm (GA)

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