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Donkey and Smuggler Algorithm Tuned IDDF Controller for Stability of Multi Area Power System with HVDC Line

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Abstract:

This paper presents the implementation of the integral-double derivative with filter (IDDF) controller based on the donkey and smuggler optimization algorithm (DSA) for regulating the frequency of the interconnected power system (IPS). The functioning of the IDDF is tested on a multi-area simple thermal hydro system (MASTH) for the instance of impressing area-1 with the perturbations of 10% step load (SLD). However, the consistency of the IDDF is validated with other widely accepted controllers. Further, the high voltage better dynamical performance. The inclusion of the HVDC line the simulation results. Ultimately, the proposed control mecha loadings, the MASTH with HVDC line under the DSA-based I at the secondary as well as at the territory level.

Published in: 2024 International Conference on Distributed (

Date of Conference: 15-16 March 2024

Date Added to IEEE Xplore: 08 May 2024

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I. Introduction

The crucial hankering of the IPS network is to bring forth an uninterrupted electric supply to the customers. However, the reliability of supplying electricity to the customers is also the most important aspect which can be accomplished by sustaining the equilibrium between demand and production. The control area frequency is the decisive parameter that reflects the equilibrium between demand-supply and further, it is the parameter that majorly affects the IPS stability. Thus it has been made clear that regulating the frequency could sustain the maintenance of IPS stability and its reliable operation. Frequency regulation is the principle objective of load frequency control (LFC) and has the provision in allowing the frequency drift not to violate the limits. Moreover, the LFC also facilitates the relaxation in tie-line power drift to provide power exchange between excesses and deficit generation areas in maintaining IPS reliability [1].

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