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Increased penetration of renewable generation is expected to replace conventional generators and reduce system inertia. Future low-inertia systems are expected to include additional power sources to enhance stability by mimicking inertia and damping of conventional generators. This paper introduces such remedial actions in the formulation of direct methods for transient stability assessment. We extend our previous work on robust stability and resiliency certificates to include optimal tuning of inertia and damping coefficients for transient stability enhancement. The goal is to limit the fault-on trajectory in order to maintain the system inside its stability region. The advantage of this approach is the ability to guarantee system stability for a wider range of faults eliminating the need to carry out time-consuming simulations. An additional contribution of this paper is a novel formulation of the robust stability and resiliency certificates, which relaxes our optimization problem and allows to obtain significantly better results.

General information
Publication status: Published
Organisations: Massachusetts Institute of Technology
Contributors: Chatzivasileiadis, S., Vu, T. L., Turitsyn, K.
Pages: 5 pp.
Publication date: 2016

Host publication information
Title of host publication: Proceedings of 2016 IEEE Power and Energy Society General Meeting
Publisher: IEEE (IEEE Power and Energy Society General Meeting).
Keywords: Distributed power generation, Optimisation techniques, Algebra, distributed power generation, optimisation, power generation faults, power system transient stability, renewable energy sources, low-inertia systems stability, renewable generation penetration, transient stability assessment, damping coefficients, fault-on trajectory, Power system stability, Generators, Damping, Transient analysis, Stability criteria, virtual inertia, Lyapunov functions, Transient Stability
DOIs: 10.1109/PESGM.2016.7741496
Source: FindIt
Source ID: 2348996171
Research output: Chapter in Book/Report/Conference proceeding › Article in proceedings – Annual report year: 2016 › Research › peer-review