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Design of Wide Area Controls

Anjan Bose

Washington State University
Pullman, Washington, USA

Abstract

The availability of phasor measurements, high bandwidth communications and FACTS devices make wide area control possible. Such wide area controls has the potential of increasing the transmission limits while increasing the reliability of the power grid.

The design, testing and installation of such wide area controls is a lengthy and expensive process. The main issue is that the off-line design and testing has to be done with simulations that are not very accurate about representing the communication and computation that have to be part of such wide area controls. The latencies affected by communications and computation have a big impact on the control performance. Moreover, (open-loop) field testing is lengthy and expensive but necessary as the off-line testing methods used today are not so accurate.

A better simulation tool that can simulate not just the power system dynamics but also the dynamics of the communications and computation infrastructure will go a long way to speed up the design and testing of wide area controls. Such a simulator (Gridsim) is described in this presentation.