

Energy storage causes grid oscillation





Overview

Low-frequency oscillations (LFOs) occur when energy storage systems interact with weak grid infrastructures. What is a grid-forming energy storage system?

An equivalent model of a grid-forming energy storage system with a large-scale battery storage system operating in standalone mode has been developed, as shown in Fig. 1. The system consists of two main components: the start-up power source and the power to be started.

Are self-excited energy storage oscillations triggered by a PCS controller?

In standalone grid-forming energy storage systems, self-excited oscillations, triggered by the interaction between the storage PCS controllers and the nonlinear characteristics of the transformer, were observed. This paper presents the following conclusions. 1. Oscillations arise from poor voltage stability.

Do self-excited oscillations occur in power systems?

Self-excited oscillations frequently occur in power systems [1, 2, 3], especially with the growing presence of renewable energy in standalone networks. Understanding the mechanisms and developing suppression strategies for such oscillations is crucial.

Can voltage/power system oscillations be mitigated?

Mitigation of sub-synchronous oscillations Voltage/power system oscillations in the grid are observed under different operational conditions and faults. For instance, 17-Hz power system oscillations with a maximum peak-to-peak magnitude of 1.57%, as the ones previously presented, appear when the output of the wind farm is above 130 MW.



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