Overview of Subsynchronous Oscillations in Microgrids

Do grid-connected wind farms cause sub-synchronous oscillations?
Abstract: Sub-synchronous oscillation (SSO) incidents caused by dynamic interaction between wind farms and power system grids can threaten safe and reliable operations. This paper investigates mechanism studies of SSOs in power systems induced by grid-connected wind farms.

What is a subsynchronous oscillation (SSO) in a wind farm?
A subsynchronous oscillation (SSO) phenomenon in a wind farm integrated with a modular multilevel converter (MMC)-based high-voltage direct current (HVDC) transmission systemhas been recently observed in the real world.

When was the first subsynchronous oscillation observed in a Type 3 wind farm?
The first subsynchronous oscillation (SSO) in a type-3 wind farm with series compensated interconnection that caused severe damage was observed in Texas in 2009. Since then,analysis of the root causes and investigation of countermeasures have been carried out for such type of systems.

What is sub-synchronous oscillation (SSO)?
Sub-synchronous oscillation (SSO) causes significant damage and performance degradation in wind farms (WFs). The root causes and mitigation methods of SSO have been identified as a result of many s...

What are the mitigation methods for subsynchronous oscillation in wind power generation?
For key control technologies, has summarized several mitigation methods based on the four different stages (system planning, operation, control, and emergency protection) of subsynchronous oscillation in wind power generation systems.

Do increased parameters affect oscillations in grid-connected PMSG wind farm?
Effect of increased parameters on oscillations in grid-connected PMSG wind farm Similar to the grid-connected system of the DFIG wind farm, the connection reactance, wind speed, number of turbines, MSC parameters, and GSC parameters are selected for the PMSG wind farm.

This chapter includes the practice from ERCOT, DNV GL, Electranix, GE, and Powertech Labs. The screening method is largely focused on SSO due to type-3 wind in series compensated network. Chapter 5 presents ...

Sustained sub-synchronous oscillations are observed in an islanded microgrid consisting of grid-forming converters under a large transient disturbance. Such oscillations are studied in terms ...

This overview is focused on the WFs based on type 3 and 4 wind turbine generators and the WFs connected to

high-voltage DC transmission systems. The dominant SSO modes in each application have been presented ...

John Wiley & Sons; 1982. [50] IEEE SSR Working Group, In: Proceedings of IEEE Transation Terms, Definitions and Symbols for Subsynchronous Oscillations; 1985;104. [51] Hall MC, ...

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Due to the interaction between different grid-forming converters, various hidden attractors may emerge, which coexist with the stable equilibrium point and manifest themselves as sub ...

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2 Basic principle of KF-based SSO extraction. Fig. 1 shows a typical DFIG (or a wind farm with n aggregated DFIGs) connected to the grid through a series-compensated transmission line. Such a series-compensated ...

To realize the consumption of renewable energy such as wind power and photovoltaics in the power system, renewable energy integration system via modular multilevel converter (MMC) ...