

Special Session 13
Ancillary Services Provided by Wind Power

Session Chair:

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Scope of the Session:

With the growing penetration level of wind power into power systems, more challenges have been brought to the systems, including power quality, system reliability, stability, and planning. Due to the development of power electronics, the controllability of wind power has been largely enhanced. The modern wind farms are required to meet more stringent technical requirements specified by system operators. Different from the Maximum Power Point Tracking (MPPT) mode, modern wind farms are expected to become grid-friendly and required to support the system if necessary, i.e. to provide ancillary services. The services include regulation, load following, reactive supply and voltage control, frequency response/spinning reserve, supplemental reserve/black-start, power oscillation damping, and etc. To fulfil the requirements, different levels of wind power, including individual wind turbines, wind farms, and wind farm clusters, needs to be properly coordinated. Advanced wind power control technologies (e.g. optimal control, robust control) and devices (e.g. energy storage, SVC, SVG) have been proposed and utilized to enhance the capability of providing the ancillary services.

This special session will bring together researchers and developers from academia, industry and governmental sectors to share and exchange novel ideas, explore the inherent challenges in developing future wind power industry, investigate novel technology, explore potential capabilities of wind power and share relevant experiences.

Topics for the session include, but are not limited to:

- Modelling technology of wind turbine/wind farm
- Power system analysis with large scale wind power integration
- Availability analysis of ancillary services
- Novel controller design for frequency/inertial support provided by wind power
- Novel controller design for reactive power/voltage support provided by wind power
- Planning/Operation experiences of practical projects/demonstrations regarding the ancillary services
- Coordination of wind power and energy storage systems